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The Walls of Jericho.

TO many students of ancient architecture it may still seem incredible that the great fortress city which guarded the approach to Judæa from the east should ever be laid bare again, and its walls and ramparts traced and planned. Ever since the discovery of the Tell-el-Amarna tablets we have known that Palestine was divided up into small kingdoms in an advanced state of civilisation, with organised government and armies, their princes transacting regular diplomatic correspondence with their overlord the Pharaoh of Egypt, as far back as the XVIth century before Christ and some time before the entrance of the Hebrews. But hitherto archæological excavations in the Holy Land have not been productive of much, partly owing to Turkish restrictions and partly owing to the destructive effects of the cold and wet winter seasons. Nevertheless, the recent digging of Drs. Sellin, Langenegger, and Watzinger, for the German Orient Society, has laid bare a large part of the site of Jericho, a city already ancient when sacked by the victorious hosts of Israel under Joshua; and the excavations promise to be among the most important ever conducted in Palestine.

The site of the ancient city of Jericho is a large oval mound 360 metres long by 160 metres wide, situated about a mile and a half to the north of the modern town of the same name, and known from a neighbouring spring as "Ain es-Sultan," or the Sultan's spring. The whole of this space was walled in by a massive city wall, with towers projecting at apparently irregular intervals; this has been laid bare at the northern end of the mound for a length of 250 metres and at the southern end for 150 metres. At the northern end of the mound the citadel has been exposed, a massive structure protected by a double wall strengthened by cross-walls and flanked with towers, in the interior of which were a large number of houses built closely together, some being in a very good state of preservation. Except for tentative trenches here and there, the rest of the huge mound remains unexplored.

Before describing the structure of the exposed remains it will be well to give some explanation of the various epochs into which the buildings may be said to fall. The greater part of the best work may be described as "Canaanitish," that is to say, belonging to the great period of civilisation dating, perhaps, from the XVIIth to the XIVth century B.C., and before the Hebrews had entered Palestine or become the dominant race. The next period is that called by the excavators "Israelitish," or belonging to the period of Hebrew domination lasting down to the late kings of Israel and Judah, and especially to the recolonisation of the site by Ahab. The term "Israelitish" is, perhaps, misleading from an archæological point of view, as Israelitish culture was merely a continuation of the old "Canaanitish," but it will serve our purpose here as marking a different historical epoch. The last period is that called by Dr. Watzinger "late Jewish," and may be taken to include the period of time dating from the return from the exile to late Roman or early Byzantine times.

Undoubtedly the finest thing as yet laid bare is the great surrounding wall. It is a magnificent piece of fortification, and is for far the greater part to be ascribed to the Canaanitish period. The massive stonework gives it a cyclopæan strength; and its general arrangement, its sloping outer surface, and its rounded angles, make a comparison with the structure of the walls of Troy irresistible. The massive walls found by Schliemann at the latter site, especially those of the "second city," have all the same characteristics as these of Jericho, and there can be little doubt that there was a close connexion between the building technique of the cities of Western Asia Minor and those of Syria and Palestine. The builders of the great outer wall of Jericho were certainly masters in stonework and masonry. In construction it is arranged in three tiers; a foundation, a sloping stone wall (the full height of which was about 5·40 metres), and a crowning upright wall of mud brick about 2·60 metres high. The foundations are laid on solid rock, which had been carefully levelled and prepared with a layer of mud and rubble. The wall reared on this foundation is constructed of blocks of local stone laid in courses, the outer face sloped backwards to such an extent as to make a difference of 2·50 metres between the width of the bottom and top of the wall. The two lower courses are made of enormous blocks of stone varying from 1·00 × 1·20 metres to 1·00 × 2·10 metres in size. As the courses ascend the stones get smaller and smaller, the upper courses being composed of medium-sized blocks. On the top of this come two courses without a batter, but built straight up, and on this rested the mud-brick wall. Thus a fortification of immense strength was formed, resting on the solid rock, with a sloping *glacis* of stone crowned by a wall of brick, and its imperviousness to attack was heightened by the fact that all the angles are rounded off, and the whole wall built in the form of a huge oval. Sections of the wall made in various places show that the sloped outer face is not always at the same angle, and lead to the conclusion that the wall had been

restored by different builders from time to time. In places mud-brick towers projected from the wall, one of which has been partially uncovered and its door plan traced, but until further excavations have been carried on it is impossible as yet to ascertain how many of these there were, and whether they were placed at regular intervals or not.

At the north-east end of the mound is the citadel, placed within the arc formed by the great outer wall on the north. Its northern walls and the space between it and the great outer wall has, so far, only been laid bare, but it was apparently in the form of a rectangle with towers situated on the angles. It is protected by a double wall, the space between inner and outer being about 3·50 metres. The towers are situated on the inner wall, that on the north-east having an area of 12·20 × 5·00 metres, that on the north-west only 8·30 × 4·70 metres. The larger one thus projected on to the outer wall, but in order to compensate for the weakness of the north-east corner, where the tower was smaller, the outer wall is rounded at the angle. The length of the walls between the two towers is 60·50 metres, and dividing space between the outer and inner is divided up into compartments by solid brick walls which offer no communication with each other. Sockets and the remains of beams found in these compartments suggest that they were once roofed over with wood, but their *raison d'être* is not easy to see. The walls of the citadel are of mud-brick on a stone foundation, bonded with mud-mortar, the walls of the tower being strengthened at the angles by quadrangular blocks of limestone. The general arrangement of this building presents several problems, and, although there is no doubt that a large part of it is Canaanitish work, a good deal must belong to later times and to the hands of the Israelites.

The interior of the citadel was found to be a perfect warren of small houses threaded, as in many eastern bazaars to-day, by a single thoroughfare, many of the houses being only reached by passing through their neighbours'. One of these was found in a very good state of preservation, with its guest-chamber, sleeping-rooms, kitchen with ovens, and court with a bench for the servants to sit on, complete. Under the floor of some were the remains of children who had been buried in earthenware pots. The excavators seem uncertain as to the date of these buildings, but suppose that they are of the Israelitish or even late Jewish period. If this is so, the discovery of the child burials in jars is interesting, but at present it seems difficult to assign a definite epoch to them. Between the citadel wall and the great outer wall there were also situated several houses, the majority utilising the walls, leaning against them, a fact which recalls the description of Rahab's house in the Old Testament. Some of these houses the excavators consider to be Canaanitish, but the majority are probably considerably later.

In other parts of the mound not much has yet been done. Near the angle of the north-western tower Dr. Langenegger found some enormous mud-bricks (·70 × ·40 × ·19 metres) which he considers to have belonged to some very early construction. On the west it seems as if the great outer wall disappeared for some distance, its place being taken by a building, of which two very massive walls with a sharp glacis have been traced; one ends with a pilaster and door lintel, the other in what apparently was a tower. Several flights of steps leading up to the mound have been discovered, but these are probably of Byzantine or even mediæval date, and were made by peasants when the top of the mound was cultivated. A good deal of pottery has been found, most of which is Eygptian or influenced by Egyptian style, thus showing that, although the architecture borrowed nothing and possessed distinctly a style and massiveness of its own, the long domination of Egypt had stamped its influence very strongly on the handicrafts of Palestine.

These very interesting discoveries have shown us to what skill in building and fortification the old Canaanites attained, and it is no wonder that the Hebrew tradition makes the taking of Jericho a great national feat. The German Orient Society are to be congratulated on their work, and it is to be hoped that fresh discoveries will crown their labours when they continue their excavations on the mound next season. The mighty buildings of Egypt we know; what has been left of Babylon and Nineveh has been carefully excavated; the Minoan palaces of Crete, the Mycenean strongholds of Greece and Asia Minor have been explored; but, with the exception of Lachish, Palestine is still an unknown land. It is therefore with great interest that the further excavation of Jericho will be awaited.

NOTES.

The Trafalgar-square Subway.

ONE of the obligations imposed on the Baker-street and Waterloo Railway Company under their Act of 1905 was the construction of a subway between Trafalgar-square and the southern side of Charing-cross. For some time past the company have given evidence of considerable reluctance to commence this necessary and desirable work, and they now propose to ask the sanction of Parliament for its entire abandonment. No doubt such action is likely to be popular among shareholders, but the general public have everything to gain by the fulfilment of the original agreement. The crossing in question is one of somewhat dangerous character and tends to become more and more dangerous as motor vehicles increase in number. Moreover, it is really to the interest of the railway company to make easy the access of passengers, thereby attracting traffic that might be caught by passing omnibuses. In any event, our sympathy is altogether with the Westminster City Council, who have now decided to insist upon the system of underground communication for which provision has already been made by Parliament.

Water-Supply to Villages.

A PAPER on this subject was read last week at a meeting of the Institute of Sanitary Engineers by Mr. S. Barlow-Bennett, an Associate of the Institute. The different sources of supply were considered, and something interesting was said about each, but it was obviously impossible to deal thoroughly with such a wide subject in a single paper. Four main sources or methods of supply were described by the author—the collection and storage of rainwater from roofs and artificial collecting areas, springs and wells, streams, and gathering-grounds with storage-reservoirs—and we are inclined to think that if the author had confined his attention to any one of these divisions of the subject, he would have produced a paper of equal interest and of much greater practical value. In connexion with the use of water from streams, the hydraulic ram is defined as "an arrangement by which the energy obtained by a falling body of water is applied to raise a portion of itself to a greater height than the reservoir from which it is fed." This is a true definition of the simplest type of ram, but there is another type in which "the falling body of water is applied to raise," not a portion of itself, but other water; this type is not mentioned, although it is the best when the supply of pure water is small and the energy of a large stream of less pure water is available. The paper, we may add, was illustrated by a number of interesting lantern-slides—nearly all from photographs of works in progress or in actual operation.

The Assuan Dam.

WE have already described and illustrated in detail the construction of the protective works on the downstream side of the Assuan dam, as recommended by the late Sir Benjamin Baker. From the Report issued this month by Mr. A. L. Webb, Under-Secretary of State for Irrigation in Egypt, we learn that at the time of writing the works had stood the test of two whole seasons, during which the discharge through the sluices took place under every kind of condition. It is highly satisfactory to know that the results have been eminently successful and that not a single stone has been displaced out of the enormous area covered by the floors of the new aprons. So far as protective measures are concerned, the dam is now perfectly safe—as, indeed, it is in all other respects. Moreover, any portion of the aprons can be exposed for examination whenever required, and therefore there is no reason for future anxiety as to the possibility of erosion on the downstream side of the foundations.

Departmental Decisions.

TO THOSE concerned with matters relating to Local Government a little volume entitled "Departmental Decisions," and issued quarterly, should prove extremely useful. We have before us the thirteenth quarterly issue, which contains in the first place the Departmental decisions of the Board of Education, The Treasury, The Local Government Board, etc.; and, secondly, notes on the decisions given in the Courts relating to Local Government Law. The readers of our columns will be familiar with many of the legal decisions set out in this volume, but the notes appear to us remarkably well written, containing a summary of each

decision expressed in few words, but with considerable accuracy.

Tests with Fire Extinguishers.

A REPORT by the British Fire Prevention Committee describes and illustrates in full detail a series of tests undertaken in September last on a high-pressure tank fire extinguisher. This apparatus is of somewhat novel design, consisting of a cylindrical tank of 125 gallons capacity providing chemically charged water at the pressure of 40 lb. per square inch and intended for use in places where a supply of water is not available for dealing with outbreaks of fire. A small air pump is attached to the cylinder for bringing up the pressure which is afterwards maintained by the carbonic acid gas generated from acid and bicarbonate of soda automatically mixed inside the cylinder. The tests demonstrated the fact that the apparatus used in conjunction with two sprinkler heads was capable of checking small fires in their early stages within a period of about four minutes. Test No. 9 shows that, although the discharge may be able to hold a fire in check, yet the quantity of liquid may be inadequate to subdue the flames entirely. This, of course, is only to be expected, for 125 gallons of water will not last for very long. In our opinion the main value of the extinguisher is its efficiency if brought into action immediately after the commencement of a small fire.

The Standardisation of Refractory Materials.

SINCE the formation of the Engineering Standards Committee work of the kind specially belonging to that organisation has been taken up by several other engineering and kindred bodies. The most recent movement of this nature is one inaugurated by the Ceramic Society with the commendable object of arranging and classifying materials used in the construction of furnaces, kilns, and ovens, of formulating standard specifications for the raw materials and the products manufactured therefrom, and of drawing up standard methods of testing and analysis. We are glad to learn that a body representing various engineering and industrial associations has been constituted under the provisional title of "The Committee for the Standardisation of Refractory Materials." Sections of the main body will institute inquiries into specific branches of the subject, and final reports will afterwards be issued by the general committee. The work to which we refer should be of considerable value to architects, and is obviously one to which the co-operation of the Royal Institute might appropriately be invited.

Railway-Train Fires.

DESPITE the many disastrous fires which constantly occur in railway-trains throughout the world, there is comparatively little evidence of a disposition, on the part of those responsible, to abandon the use of combustible materials in the construction of passenger-carriages. The alarming fires which took place on the Liverpool and Southport electric line last week come as additional reasons for reform in this matter. The first outbreak was due to a collision, which resulted in short circuiting of the electric current and the destruction of four carriages by fire. Presently a train arrived on the scene from Southport, and this also caught fire. In these days of enlightenment it is really preposterous that railway-trains should be constructed mainly of substances that are ready to burst into flame on the least provocation. We know that the cost of substituting rational construction all at once would be enormous and quite beyond the means of railway companies. But it would be strictly reasonable for Parliament to forbid the continued employment of unsuitable materials and to make regulations providing for the gradual elimination of vehicles which constitute a latent danger to the travelling public.

Westminster County Court, St. Martin's-lane.

THE Westminster County Court, together with the registrar's, and the high bailiff's offices have just removed from the temporary quarters in the (old) Bankruptcy Court, Lincoln's Inn-fields, to the new Court-house in St. Martin's-lane. The old Bankruptcy Court will be finally closed on February 15, and the site is to be taken for an extension of the Land Registry Offices. The new Court House has been erected by his Majesty's Office of Works upon the site of the former one, on the west side of St. Martin's-lane, which was established in 1846, the business being conducted for a short period in the old Court of Requests, formerly a Baptist Chapel, in Castle-street, at the rear—as plotted in a plan, 1799, of the parish reproduced in the *Builder* of July 2, 1904. For the former Court-house in St. Martin's-lane was pulled down No. 82, which since about 1760 had been known as "Young Slaughter's," or "New Slaughter's" coffee-house. The original house, which then took the style of "Old Slaughter's" was at No. 75, which, in the winter of 1843-4, gave way to Pennethorne and Chawner's joint scheme for the laying out of Cranbourne-street. The limits of the jurisdiction of the Court have, we believe, been somewhat reduced; they originally extended over the wide area bounded by a line winding from Chelsea railway bridge to the north end of the Serpentine, thence along Bayswater-road, Oxford-street, and High Holborn to Holborn Bars, and so, marching with the City boundary, to the Thames. That boundary includes, on the east side of the course of the Tyburn, nearly all of the ancient confines of the parish of St. Margaret, Westminster, as delimited by King Edgar's charter to the Abbey, but curtailed, by the decretal of 1222, so as to exclude the eastern portion round about Drury-lane, Lincoln's Inn-fields, and St. Clement Danes.

Camberwell School of Arts and Crafts: Annual Exhibition of Students' Works.

THE annual exhibition of the work of students of the Camberwell School of Art is now being held at the South London Art Gallery. A high standard of excellence is maintained in all branches of the arts and crafts. Sound workmanship on the right lines is evident in the examples we saw of carpentry, masonry, plastering, and leadwork; the latter exhibit comprising some cisterns of very good design and execution. In the work of the architectural students we noticed some designs of considerable merit for a terrace of houses with a forecourt to the public road. Mr. C. Pledge's drawings show most power of design and draughtsmanship. Mr. R. Montes's drawings and paintings from the life are of quite unusual excellence; the same gentleman's designs for book-illustration in pen and ink show a similar mastery of the figure; we consider his work quite the best in the room. Mr. L. Saggs's designs for book-illustration are excellent. His lithographs are not so good; in "Rural England," an excellent conception, the grain is coarse, and the colours do not register satisfactorily. Mr. A. S. Hayes's illustration of "The Knight and the Lady" is good, particularly the drawing of the female figure. The coloured woodcuts by Messrs. E. Chapman and L. Hamilton possess great merit, though we confess to a dislike of the studied rudeness of modern wood-engraving. The specimens of dressmaking we do not venture to criticise; we would, however, draw attention to the excellent practice of sketching examples of drapery and costume from ancient sculpture and the National Gallery; dare we harbour a hope that the dressmakers of Paris would follow the example of Camberwell? The Exhibition will remain open till February 8.

New Academicians.

WE are glad to record that Mr. John Belcher, the eminent architect of many fine and artistic buildings, has been elected from the ranks of Associates to the honour of "R.A." Mr. Goscombe John, also an Associate, has been elected R.A., a choice which his fine works in sculpture fully justify. The Australian sculptor, Mr. Bertram Mackennal, has been elected A.R.A.; the only surprise as to this election will be that it did not come earlier. M. J. Paul Laurens, the eminent French painter, has been elected Honorary Foreign Academician. The honour could not have been better bestowed than on a painter whose works combine, in an unusual degree, intellectual interest with learned and powerful execution.

MONTAGUE HOUSE, BLOOMSBURY.

ON January 15, 1759, visitors were for the first time admitted to view the Sloane, Courten, Harleian, and Cottonian collections, which, with the "Old Royal Library," given to the nation in 1757 by George II., were stored in Montague House. That mansion had been built in 1687 by Pierre Poughet, a native of Marseilles, for Ralph, Baron Montague, afterwards Marquis of Monthermer and Duke of Montague. The great gate, surmounted with an octangular lantern and cupola, and the screen wall along the north side of Great Russell-street, were standing in 1850, as depicted in a drawing by Findlay. Poughet's building, constructed of red brick with stone dressings, and having pavilions at the wings after the manner of a French "hotel," had ceilings painted by La Fosse, and other decorative work by Rousseau and Jean Baptiste Monoyer. It was erected upon the site, and with part of the walls, of the house which Robert Hooke had built in the Long, since Southampton, Fields for Lord Montague in 1678-9. Evelyn records in his diary two visits he paid to that, the earlier,

house. He describes it as being "somewhat after the French; . . . most nobly furnish'd, and a fine, but too much expos'd garden." (November 5, 1679.) On October 10, 1683, he eulogises "Signior Verrio's fresca paintings," and the gardens; he says: "The court at entrie and wings for offices seeme too neere the streete," and comments upon the defects of that part of the planning. The gardens, about eight acres in extent, lay between those of Southampton House (the Duke of Bedford's) on the east and a grove of elm trees on the west; open fields to the north formed a chosen resort of duellists; the Field of Forty Footsteps remained vacant until little more than one hundred years ago. In a letter written to Dr. Fitzwilliam, Lady Rachel Russell describes the destruction of the house by fire in the early morning of Wednesday, January 19, 1686.

The second and last Duke of Montague died in 1749; his house in Bloomsbury passed to the Earl of Halifax. Sir Hans Sloane died in 1753; in that year an Act was passed for the purchase, at his own price of 20,000*l.*, of Sloane's museum, greatly enriched by the collections bequeathed to him by William Courten in 1702, and of the Harleian MSS., and "for procuring one general repository for the better reception and more convenient use of the said Collections, and of the Cottonian Library and additions thereto." The Government paid 10,000*l.* for the MSS., which the Lady Margaret Harley (Duchess of Portland) had inherited from her grandfather, Robert, first Earl of Oxford and Mortimer; that being the price at which she, with a public spirit beyond all praise, had willed that the collection should be acquired for the nation. Harley's labours were largely supplemented by the assiduity and solicitude of his librarian and coadjutor, Humfrey Wanley, at one time an assistant in the Bodleian Library, whose learning and unflagging industry scarcely receive the recognition they so justly deserve. In 1700 Sir John Cotton, Bart., had given to the nation the library which derived its origin from the collection made by his ancestor, Sir Robert Cotton, in the reigns of Queen Elizabeth and her successor. A lottery for raising 300,000*l.* was set up by the Act of 1753, a body of trustees was constituted, and Montague House was purchased from the Earl of Halifax for 10,250*l.* New rooms were added from time to time for the display of the antiquities from Egypt (1801); the Elgin, Phigaleian, Canning, and Towneley marbles; and other acquisitions. The erection of the present museum was begun in 1823, after designs by Sir Robert Smirke, R.A., to whom in 1846 succeeded his brother Sydney. The main block of Montague House finally disappeared in 1845; the portico, with sculpture in the tympanum by Sir Richard Westmacott, R.A., was completed on April 19, 1847, exactly twenty years before Sir Robert Smirke's death. The gates and railings, executed by Walker, of York, were modelled by Lovati, who died whilst engaged upon the work; his designs were carried out by Thomas, and by Collmann & Davis. Alfred Stevens modelled the lions for the standards of the dwarf-railing, lately removed; some of them may be seen in the museum.

THE ARCHITECTURAL ASSOCIATION:

SPECIAL MEETING.

A SPECIAL general meeting of the Architectural Association was held on Friday last week at No. 18, Tufton-street, Westminster, S.W., Mr. Walter Cave, President, in the chair. The meeting was called for the purpose of considering some proposed alterations in the by-laws so as to expedite the election on to the Council of younger members of the Association.

Mr. C. Wontner Smith, hon. secretary, read the by-laws affected and also the proposed alterations. The first proposal was as to by-law 29, and it was agreed to insert the word "last" in place of "first" week in September.

It was then agreed, after a brief discussion, to add the following words to by-law 31:—

"No member shall be eligible for election to any office on the Council except as Hon. Treasurer, Hon. Librarian, or Hon. Editor of the Architectural Association *Journal* unless he shall have served on the Council for one complete session."

It was also agreed to substitute the following as by-law 33:—

"No member shall be eligible for the office of President or Vice-President unless he has previously served on the Council for one complete session. The office of President, Vice-President, or Librarian shall not be held by any member for more than two consecutive sessions. The retiring President shall be entitled to a seat on the Council as an ordinary member for the ensuing session, but thereafter he shall be ineligible to serve on the Council or for any office, except that of Hon. Treasurer. The office of Treasurer shall not be held by any member for more than five sessions."

In by-law 21 it was proposed to insert: "ten ordinary members, including the retiring President" instead of "nine."

The Chairman said that the object of the proposal was in order to provide a seat on the Council for the retiring President for one session after he retires. After that he was ineligible for office in the Association of any description except as honorary treasurer; and that, he thought, was a very good system, for it ensured that men should not be too long on the Council.

Mr. Alan Potter suggested the insertion of the word "honorary" before "Editor of the Architectural Association *Journal*."

The suggestion was adopted and the proposals were agreed to.

The next proposal was as to by-law 34: It was proposed to omit by-law 34 as printed in the *Brown Book*, and to substitute the following:—

"The office of Hon. Secretary and that of Junior Hon. Secretary shall not be held for more than one session each, *i.e.*, one year as Junior Hon. Secretary and one year as Senior Hon. Secretary. Members are eligible for election to serve as ordinary members of Council for not more than three consecutive sessions, or for more than two consecutive sessions after each tenure of office on the Council."

The Chairman said that that again was proposed in order to ensure the more rapid progress of members through the Council, and also to relieve hon. secretaries serving for four years, which, it was considered, was too long a period for anyone.

The proposal was then agreed to.

From by-law 36 it was proposed to omit the word "solicitor" as an *honorary* officer.

The Chairman said they had come to the conclusion that as the solicitor had a great deal of work to do and he received a special fee or honorarium, it was thought to be more dignified for a society like the Association to pay its solicitor. It actually made no difference, but it seemed better not to have an honorary solicitor in the ordinary sense of the word.

The alteration was agreed to.

It was then proposed to substitute the following for by-law 37:—

"A register shall be kept of the names and addresses of the members, and a further register shall be kept (for members only) of those requiring engagements. Members failing to notify the Secretary immediately upon obtaining an engagement, shall be liable to be suspended from the benefits of the register for a period not exceeding six months."

The Chairman said he felt that would receive general support in the Association. It made the register a close one really.

The proposal was agreed to, and the special meeting then concluded.

The ordinary general fortnightly meeting then followed.

The minutes were read and confirmed, and Mr. C. O. Hooper was nominated for membership.

Announcements.

Mr. C. Wontner Smith then made the following announcements:—

A meeting of the Debating Society on January 29. Paper by Mr. H. J. Leaning on "Approximate Estimating" at 7 p.m.

Annual general meeting of the Camera and Sketching Club on January 28. (Election of officers.)

Second spring visit on January 30 to the additions to General Post Office, Newgate-street, by permission of Sir Henry Tanner. Members to meet at the building at 3 p.m.

The following gentlemen were then elected as members of the Association:—

E. L. Apperly, Lancaster-gate, W.
O. Newbold, Beckenham.
H. Boyd-Walker, Rosario, Argentina.
C. J. Newbery, Adelphi, W.C.
B. H. B. Symons-Jeune, Henley-on-Thames.
T. H. Chalkley, Bermondsey, S.E.
A. C. Newman, Chiswick, W.
J. B. L. Tolhurst, Beckenham, Kent.
A. Thorpe, Hampstead, N.W.

Mr. C. H. Thewlis was reinstated as a member.

The Chairman said he desired to propose a vote of thanks to Mr. J. Macvicar Anderson for his donation to the library of bound volumes of the *Builder*, dating from 1843 to the present date. It was a very valuable addition to the library, and he was pleased to make the announcement.

The vote of thanks was agreed to; and a similar vote was accorded to the Royal Institute of British Architects' Council for its donation to the Association of a framed drawing of the Houses of Parliament, which belonged to Sir Charles Barry.

The Chairman said that no doubt the drawing was a contemporary one of the time the Houses of Parliament were built, but as to whether it was a drawing made in Barry's office there was considerable doubt. But their thanks were due to the Institute for the gift.

Reinforced Concrete.

Mr. J. H. Markham then read the following paper on "Reinforced Concrete," and showed a number of lantern slides, drawings, etc., of reinforced concrete work:—

"You are probably aware that when I was first asked to read a paper on "Reinforced Concrete," it was to have been more especially with reference to design—that is, I presume, the character of artistic expression suited to this method of construction. I rashly undertook to do this; but in attempting to get together matter for illustration and example, I found the question of the proper artistic treatment had very seldom been fairly tackled in building work of a kind usually within an architect's practice. A good deal of simple straightforward engineering work has been done which, I think, is often of pleasing appearance when not spoilt by any pretence to be other than it is. But when buildings, such as an architect is accustomed to deal with, have been undertaken in this method of construction, the front has generally been built of brick or stone, and the reinforced concrete part all been hidden, as would have been the case with a steel frame. This has compelled me to take up the chief features and principles of this method of construction, and try to deduce therefrom some ideas for the right treatment of it.

To get out of my difficulty, I have decided to assume you know nothing about reinforced concrete; so that I shall deal briefly with the subject in a general way, and I must apologise if I go over what will be familiar ground to many. I will begin by briefly describing the materials used, viz., concrete and steel.

Concrete.

Taking concrete first. Concrete is composed of a matrix or cementing material and an aggregate.

The matrix used in reinforced concrete work is Portland cement, and must be of the best possible quality. Limes are not suitable, as they are at best of imperfect hydraulicity, that is, their power of setting when air is excluded is but small and variable, and they are of less ultimate strength than cement. The cement should be frequently tested, as so much depends on its quality. Portland cement is an artificial compound obtained by calcining lime and clay in proper proportions, and grinding the resulting clinker. After much experience and experiment it can now be obtained of very high quality, and on no account should limes, or natural cements, or an inferior Portland cement be substituted.

It is essential that the aggregate be

composed of a material which does not contain acids capable of corroding the metal, and for this reason coke breeze and furnace slag must be used with caution, if at all. The best materials are: crushed ballast, broken brick, granite chippings, and broken stone; though limestone cannot be recommended where great fire-resisting qualities are required. No particles should exceed ¾ in. in diameter, unless where the reinforcement is spaced further apart than usual, otherwise they will not be able to pass easily between the reinforcements, so that there may occur voids in the finished work; and it is desirable that particles be not all of the same size, but varying from ¼ in. to ¾ in., so that the smaller particles may fill up the interstices between the larger. Material having grains less than ¼ in. in diameter is known as sand, and a certain proportion of clean, sharp sand free from loamy or organic matter is used to form, with the cement, a mortar which shall surround each particle of the ballast or stone, and so unite all the particles, and, as far as possible, fill up all the voids so that the whole may be a solid compact mass.

A good proportion in which to mix the ingredients of the concrete is 1 part of cement to 2 of sand to 4 of ¾ in. ballast, measured by bulk. This does not mean 1 of cement to 6 of aggregate, because when the sand and ballast are mixed the sand fills up some of the interstices in the ballast, and the whole comes to about 1 of cement to 4½ of aggregate. This should be carefully noted, because at first one is inclined to think 1 of cement to 2 of sand and 4 of ballast is equivalent to 1 of cement to 6 of aggregate, but it is in reality a good deal richer.

It is essential that the ingredients be in such proportions that the sand and cement fill up the voids in the ballast, so that the smallest possible percentage of air-spaces may exist in the resulting concrete. Concrete cannot be obtained absolutely free from air-spaces.

Steel.

The steel used is mild steel of good quality. The specification of it I need not repeat; it is to be found in the Report of the Committee on Reinforced Concrete, published by the Royal Institute of British Architects. It is usually employed in the form of round rods, from 2 in., or sometimes 2½ in., in diameter, down to wire; and some systems use also a flat section like hoop iron, as in the Hennebique shear stirrup. Other systems have special deformed bars—but of that more later.

Materials Easy of Access.

I need scarcely point out that a great advantage of reinforced concrete is that in almost any district suitable materials can be found near at hand. Cement is made in all parts of the country; and Mr. Kahn pays a very high tribute to the quality of British cements in a paper read before the Institution of Engineers and Shipbuilders in Scotland, in which he says they are probably the best in the world, fully 100 per cent. better than American, and many times better than Belgian.

A suitable aggregate should not be far to seek anywhere, and even if the steel has to be brought some distance it is only about 20 per cent. of what would be necessary in a steel-frame building, and would always be of small section and easily handled.

Reasons for the Combination.

Having briefly described the materials employed, it remains for me to say a few words as to the reasons for combining two materials so essentially different. Concrete, as you know, is a comparatively inexpensive building material, and, when well made of suitable ingredients, capable of withstanding considerable compressive stress and offering resistance to fire. Steel and wrought-iron, on the other hand, are expensive and of great strength in both compression and tension. Well, now, the notion arose of combining the two, so that steel might be used to resist all tensile stresses, and the cheaper concrete might be used to resist all compressive stresses and provide a protecting covering for the metal.

So far so good, but now a difficulty arises in one's mind: we all know the disastrous effects of iron cramps used in stonework when insufficiently protected from the action of the weather; so that it is essential that all metal used be absolutely covered to prevent the action of the atmosphere thereon. But will the moisture of the concrete and the acids of the cement corrode the metal? This is a point of all importance, and there are many interesting facts and tests which are too numerous to recount, but which in the main go to prove that, so far from the cement having any harmful effect on the metal, it not only preserves it from rust, but, if the metal have a little rust on the surface when inserted in the concrete, the rust is removed and the metal if afterwards withdrawn will be found bright and clean, and, moreover, less liable to rust than a piece of metal which had not been in contact with cement. The explanation of all this is an interesting question for chemists, but the facts serve to show that no better preservative can be found for steel than cement. It is, of course, known that the steel is not painted or otherwise treated before being used. No loose scales of rust must be allowed, but a slightly-rusted surface is rather an advantage, as it assists the adhesion between the metal and concrete.

I should add that if from any cause cracks occur in the concrete, then water may get in and the metal become oxidised.

If there is any fear of small quantities of water penetrating the concrete and coming in contact with the metal, then it would be advisable to cover the bars before use with a coating of cement grout, so that they would be completely covered by cement, even if the concrete should prove a little porous. It should also be mentioned that a few cases have been cited of metal corroding without any apparent cause, but such cases are few, and probably could all be accounted for by some causes other than the failure of concrete, when probably made and not cracked, to preserve the metal. The general inference from all the information I have come across is pretty much what I have stated.

Design.

I will now come more particularly to my professed subject, namely, design. And in dealing with design I shall divide my remarks into three main heads:—

I. What I shall call "internal" design.
II. Main structural lines and forms.
III. Decorative design and finish.

Internal Design.

A great peculiarity of reinforced concrete is that not only, as with other better known materials, is it necessary to decide on the size a member must be, but it is also necessary to design the internal structure of the member itself. In fact, it is necessary to design the material as well as the building.

In using steel or wood, a member of certain size and section is found necessary, and it consists throughout of the same steel or wood of known, and practically uniform, strength; and all members of the same size and section will be approximately of the same strength. However, the strength of reinforced concrete members of any given size and section may vary within very wide limits according to the percentage and disposition of the metal, even where the strength of the concrete and steel may be constant. It would be possible to introduce, say, 1 per cent. of metal into a concrete beam without in any way strengthening it; and it would also be possible to introduce 1 per cent. of metal in such a way as to very materially raise the moment of resistance the beam could offer. It is not quite my province to-night to deal with this question of internal design, which is a very large subject, as there are many systems, some of them covered by patents, which make it somewhat awkward for a designer to make use of the method of reinforcement he may consider most suited in each particular kind of member. However, I propose to briefly go over the principles.

As I have already stated, the general principle is to use steel to resist all tensile stresses and to provide against the tendency to shear, whereas concrete is used as far as possible to take all purely compressive stress. That means to say that, in the case of beams, metal reinforcement will be found imbedded in the lower part, whereas the upper portion will be of concrete. If, however, as is usually the case in reinforced concrete buildings, beams are continuous over two or more spans, then a reverse bending moment occurs over the supports causing the upper side to be in tension and the lower in compression, so that here the reinforcement comes in the upper part of the beam. It may, of course, be advisable to introduce reinforcement in the compression area of a beam as well; but I will not speak further of that, as I am only giving a very general statement of principles, leaving all matters of detail and description of peculiar cases, for lack of time. I would only say as to this before passing that, if compressive reinforcement is introduced it is a departure from the ideal that all metal should be always and only in tension, and all concrete always and only in compression. But this ideal has to be often departed from, and for practical reasons it is often necessary to put metal in the compressive area. M. Coignet does so regularly. The concrete occurring in the portion subject to tensile stress is ignored in calculation, as it is not permissible to rely on concrete for resisting tensile stress even in the smallest degree.

Tendency to shear is resisted by steel members, loose in the form of hoop steel or round section stirrups, or rigidly attached to the tensile reinforcement, placed either vertically or obliquely.

Tension Members.

For tension members, in a truss form, to conform to our ideal, no concrete should be used. However, concrete must be used to cover and protect the metal, no more being introduced than is necessary for this purpose; and it must not be reckoned in the calculation. In the same way it would seem at first sight that no steel should be used in compression members, but on consideration we shall see that it may be to advantage without any serious infringement of our ideals. Suppose a compression member—say a column—of concrete supporting a load. The tendency of the load is to produce a reduction in the length of the column; and, as matter is only slightly compressible, there will be a tendency for the material to find compensation for this shortening by enlarging in another direction. This enlarging will take place where it meets with least resistance; that is, in planes at right angles to the direction of pressure; in the case of a column, horizontally. This tendency to enlarge horizontally—that is, to spread—will tax the cohesive strength of the outer portion of the column; in other words, there will be a circumferential or hoop tension. But it is not desirable to submit concrete to tensile stress; and as it would seem that some small hoop tension will always be produced in a compression member, because there will always be at least a tendency to diminish in length under the applied load, some form of metal case seems called for which shall be capable of taking up the circumferential tension and so prevent lateral spread. Assuming this to be done, we have a member in which our ideal is satisfied. The hypothesis that concrete must not be relied on to resist tension, traced to its logical end, is tantamount to an assumption that concrete is possessed of no cohesion; so that our ideal column becomes analogous to a steel cylinder filled with some such material as fine sand. In such a member, the sand obviously could not be crushed, and, after taking such slight reduction in volume as the pressure could produce, its power to resist unlimited pressure would seem to

depend only on the capability of the containing cylinder to resist the hoop tension and the shearing stress. Now to return to our concrete column; as concrete does possess cohesion, the cylinder may be replaced by hoops at frequent intervals or by a spiral binding; and to further prevent the tendency to spread, by bulging between the hoops or spirals, let us introduce a few longitudinal bars just inside the hoops to form with the hoops a sort of containing network. These longitudinal bars can also be relied on to resist the shearing stress which accompanies compression and tension stresses on planes oblique to the axis of the main stress. This method of reinforcement, which seems to me theoretically ideal for compression members, has been mainly developed, and several remarkable properties thereof discovered, by M. Considere. However, the other systems of reinforcement follow much the same principle in column design.

I would only just further mention on this question of internal design that the patent systems just referred to are of two main kinds:—

I. Those in which the patent is for a particular arrangement of reinforcement.

II. Those in which the patent is for a special form of reinforcing bar.

This second class again has two subdivisions:—

(i.) Those bars which are of peculiar form to lessen the tendency for the metal to slide in the concrete.

(ii.) Those bars which have rigid or loose attachments to resist shear.

Adhesion.

As to adhesion between metal and concrete; it has been stated—based, I suppose, on experiment—that a bar immersed in concrete for a length equal to fifteen times its diameter will, if it be attempted to drag it out, break rather than slide out. If so, it would scarcely seem necessary to have recourse to any special deformation which must slightly increase the cost, unless there is some influence specially likely to produce rupture of the adhesion. In the Hennebique system bars are fish-tailed at their ends in case there should be any tendency to slide.

Among bars deformed to resist sliding may be mentioned Ransome's twisted bar, a square section twisted, and the indented bar. The Ransome bar, which, so far as I know, has only been used in America, is twisted cold; and it is claimed by those who use it that it is of much greater strength than a round bar of similar steel which has not been twisted, so that less metal has to be used. The indented bar is now in use in this country as well as America, and is sold by the Patent Indented Steel Bar Company, of Westminster. The system of reinforcement with these bars is the same in principle as that where round rods are used, as, of course, all systems meet with, and are controlled by, the same dynamic laws.

Of the bars with shear members attached, the best known is the Kahn bar; and mention must also be made of the Wells bar, used by Stuart's Granolithic Company; it is of a section somewhat resembling two round bars connected by a very small web, shear members being of hoop metal threaded through a slit in the web. But I must leave this part of my subject.

General Structure.

I now come to the consideration of the general structural lines of erections in these materials.

In beginning a design for a reinforced concrete structure, the first thing the designer feels is the absolute lack of precedent. In dealing with structures of brick and stone, or even steel, there are by this time more or less recognised ways of solving every ordinary problem of design. If the designer be possessed of great originality and can deviate from the hackneyed methods in a direction which others feel to be an improvement, then he has produced that which is not only interesting and pleasing, but he has advanced the art of design. But if he find himself unable to improve on the usual solution of the problem, then he is not blamed for adopting it; but he has failed to produce anything possessing special interest.

In designing reinforced concrete, however, no tradition or precedent exists; and if the designer should be unable to evolve from his own brain a form of structure which shall be at once sound as to constructive principles, suitable to the material, beautiful as to form and appearance, and withal practicable from a commercial point of view, then he fails to produce a satisfactory reinforced concrete building. This lack of precedent becomes a very real difficulty in a structure in which the utilitarian requirements give considerable latitude for the possible variations of form. One asks oneself, "How shall I begin? How is a thing of this sort usually done?" Then, to save oneself trouble, one is apt to fall into one of two errors, or possibly both, and to treat the structure as a steel structure would be treated, or else as a stone building.

Ancient Use of Concrete.

Here I would just refer to the use of concrete as a structural material in ancient times. You will all remember the Roman use of concrete in large masses, though with a kind of reinforcement in the form of brick arches and lacing courses. Their concrete owed much of its strength and durability to the employment of a light volcanic earth known as pozzolana, which formed with the lime a very strong hydraulic mortar. The chief uses to which concrete was then put were—to form floors, or to form large vaults and domes with brick-arched ribs and brick lacing courses, or to form walls with generally a facing of brick or stone. Since Roman times builders have not had the advantage of such an excellent material as pozzolana, and concrete almost dropped into disuse. Something similar was probably used for foundations in the form of very coarse and random rubble work, and as a covering to vaults in the mediæval buildings, but it is not anywhere evident as a part of the designed structure.

As to structural lines, the Roman use of concrete affords us no precedent for designing in reinforced concrete, because their use of the material was in enormous masses, and could only be where the principal stresses were compressive. Their concrete domes are said to have had no thrust, but act merely as inverted saucers. Where they supported nothing but their own weight the thrust might have been negligible; but it seems to me that there must have been a sort of internal arch action amongst the particles of the mass, and the thrust so produced, if not transmitted to the walls, must have been counteracted by the tensile strength of the concrete. If a superimposed load were placed on the dome, I think this thrust would surely have become more than the tensile resistance of the concrete could withstand, and unless some outside aid were forthcoming, the whole would collapse. However, as I have already stated, we do not rely on the tensile resistance of concrete in any way. Wherever tensile stress exists steel must be introduced. Moreover, another essential difference is that, whereas a Roman concrete wall was of very considerable, and practically uniform thickness, taking stresses all along, in reinforced concrete no such arrangement is permissible. A wall consists of a framework of stanchions and beams which take all the stresses, and the remainder of the wall is formed of mere screen panels of very little thickness. This is true of steel-frame buildings also; and it is this principle which is the only one that will affect the structural lines of architectural buildings. By architectural buildings I mean those kinds of structures usually designed by architects as distinct from engineering structures, such as bridges, large roofs, water-towers, etc. I think this framework and panel treatment should make itself very evident; and it would seem quite suitable to build the panels afterwards in some other material as brick, stone, block concrete, or terra-cotta, each panel being carried by the beam below it. The vertical members will, as a rule, be emphasised, as they are more important, becoming larger and stronger towards the bottom, because there they carry the whole load of the wall and their proportion of the floor loads, whereas the beams all do practically the same amount of work—*i.e.*, carry the panel over and a proportion of the floor—and are, therefore, of the same size. However, in some cases the horizontal members are emphasised, and the vertical members kept subservient. In buildings of the warehouse and factory class, the windows are often made to take up the whole of the panel space.

Architectural Treatment.

I have alluded to the tendency to treat a reinforced concrete building in the same way as a steel structure as an error. I admit a certain reasonableness in such a course on account of the fact that both methods of construction are subjected to exactly the same dynamic laws. We have already classed them together as being identical in their effect on the lines of architectural structures; but in engineering works, so-called, they will be somewhat different in their characteristic form. Perhaps it may be thought somewhat out of place for me to address you on the subject of engineering; but I see no sufficient reason for the distinction between engineering and architecture. In old times bridges, towers, viaducts, and such-like erections were designed and carried out by the same men who designed public buildings, and probably private houses as well; so that I shall presume we still maintain some sort of intelligent interest in such work, though we may never be called upon to undertake it.

There will, I think, be much more scope for the use of reinforced concrete, and opportunity to evolve a suitable style of design, in such buildings as bridges, large roofs, as over swimming-baths, etc., towers for various purposes, lighthouses, tanks, and reservoirs, to say nothing of all kinds of foundation work, than there will be in architectural buildings; and it is such I shall have in mind in speaking of the difference between steel and reinforced concrete.

In these structures reinforced concrete is likely to find favour because it does not need the periodic painting necessary to preserve a steel structure from corrosion. In most, if not all, works of this kind, economy of cost is an important consideration; and in steelwork the cost varies approximately as the amount of material employed. Not so with reinforced concrete. In a plain and simple building of reinforced concrete about 30 per cent. of the total cost is expended on centering and falsework alone, which all disappears when the structure is complete. Again the metal costs a great deal more than the concrete bulk for bulk, so that it may quite well happen that a design, which uses a considerably larger quantity of material than the minimum possible, may be of much less expense in execution, because it is of such a simple character that a great saving of falsework is effected, or members are so skilfully arranged, both as to position and their internal composition, that the concrete is made to do as much work as possible, and the minimum quantity of metal is used. Therefore I would say, first and foremost, let parts be simple and large rather than intricate and small.

In steel structures a certain all-overishness is often noticeable, arising from the use of small members in a sort of truss form of spider's web appearance; but in reinforced concrete it is better, if possible, to use larger main members and confine the connecting trusswork to certain parts. This gives a pleasing appearance from the fact that the more intricate parts are concentrated and the main members emphasised. This is, of course, not always possible, but can

sometimes be contrived with a little thought. The volume of material is increased, but a saving may be effected on the falsework.

(The ethics of imitating stonework I speak of under my third heading.) Moreover, a great saving is effected if parts are repeated, so that the same falsework may be used more than once; only it is not much good repeating any particular form or feature in another part of the structure much on the same level, because the falsework will be wanted in both places at the same time. Where repetition occurs it should, if possible, be arranged so that the falsework will be finished with in one place before it is wanted at another. I am not advocating the repetition of parts *ad nauseam* by any means, but it is quite possible often for the same form to be repeated two or three times with very slight variation not necessitating much adjustment of the falsework. In this connexion I would mention that I have been told that it is not found economical to use the same wooden centering more than three or four times. After that it becomes warped and surface-hardened, and the expense of correcting the defects is as great as forming new.

I need scarcely speak of the advisability of concentrating ornament and using it on the parts which have no great structural function to perform, so as to leave the main structural members simple and apparent as to their importance. At any rate ornament, if applied to structural members, should be such as will not in anywise render the member apparently less fit to perform its function.

Decorative Design and Finish.

This brings me to my third and last division—decorative design and surface finish. In this part of our subject we may learn a lesson from the Roman builders, in that the surface treatment of concrete may be the same whether it be used as mass concrete or reinforced. Roman concrete walls were finished in three different ways.

I. *Opus incertum*, where the wall is faced with irregular pointed pieces of stone placed with the point inwards.

II. *Opus reticulatum*, which consisted of similar pieces of stone to those of the *opus incertum*, only the faces were square and regular, and the surface presented a sort of network appearance.

III. The walls were faced with thin triangular bricks laid breaking joint.

(I shall show you diagrams representing these methods shortly.)

Yet another method was to apply marble slabs fixed to the wall by metal cramps. This method was also applied to brick and stone walls.

Vaults and domes often had coffers cut into their surface, and the whole covered with a fine *cæmentum marmoreum*.

All these methods are, of course, still possible, and to them may be added mosaic and tiling.

As to modern methods. A very favourite way is to render the surface to resemble stone construction, and in some cases V-shaped strips are nailed to the falsework to form depressions in the finished concrete similar to V sunk-jointed masonry, and the surface picked over to leave the flat surfaces rough. The attempt to imitate stonework so frequently adopted in buildings of reinforced concrete can scarcely be described as "building in truth," and therefore I must condemn it.

A certain similarity of appearance there will be of necessity between buildings of reinforced concrete and those of stone. I am not urging that this similarity, where it is natural, should be concealed, but I am deprecating any attempt at making the two alike. Two essential differences which I think should certainly have their effect on the types of design suited to each material are:—Firstly, that whereas stone walls are more or less of even thickness supporting weight all along, walls of reinforced concrete are composed of stanchions and beams with screens, as before explained; secondly, many features in stonework design are the outcome of the necessity for using this material in separate blocks. Reinforced concrete is a monolithic material. There are no joints; and I think all that, which in stone design is the outcome of the necessity for separate blocks with joints, should be eliminated. For instance, a stone column has base shaft and capital; and the capital especially is distinctly a different piece of stone from that forming the shaft or architrave, and is treated as such. If a reinforced concrete support receives an enriched treatment at its upper end, I think the ornament should run on to the beam above and possibly connect up with the base of the stanchion over. A reinforced concrete support in the form of a Corinthian column would be most inappropriate, though I would not object to a reinforced concrete beam being moulded as a classic architrave. I think my meaning will be clear.

Another method, which is rather cutting the Gordian knot than untying it, is to do all the structural and internal work in reinforced concrete, and to form the front facing screen in stone or brick, built up independently of the rest of the structure, and attached to it at the floor levels by allowing some of the floor reinforcements to project and be built into the masonry screen. This method is being employed at the road frontage of the new post-office building. When this is done, care must be taken that the slight settlement of the reinforced concrete structural part, which is bound to take place when loading has been applied, does not throw a certain amount of stress on to the masonry screen, and so cause it to bulge.

It seldom happens that the concrete can be left without further treatment after the removal of the centering or falsework in cases where the appearance has to be considered at all. Sometimes moulds are lined with zinc, sheet iron, or plaster of Paris, and oiled to prevent adhesion, and a coat of mortar, to give a smooth surface, is applied to the inside of the mould first; and then the concrete and reinforcement put in afterwards, but not forced so as to press through the mortar and appear on the surface when the falsework is removed.

In some large office buildings, erected by the Turner Construction Company, of New York, the only treatment applied after the removal of the wood falsework was to put on a coat of cement and white sand with a brush. Another method they have tried is to apply a coat of oil paint mixed with sand. In cases where very little work is done after the removal of the falsework, some special precautions have to be taken to remove the unsightly variation in texture which is visible wherever a break in the laying occurred.

A certain percentage of colouring matter may be added to the cement, if desired; the amount, say Messrs. Marsh & Dunn, in their admirable book on "Reinforced Concrete," "should not exceed 10 per cent. per volume, and should be less if possible." Of course, care must be taken to ensure that no colouring is used which will have a chemical action on any of the materials used or be easily affected by the acids and other substances in the atmosphere.

Methods of Decoration.

It would seem that in treating the surface of reinforced concrete buildings, all decoration should be comparatively flat, and if any ornamental features are added of considerable projection they must be reinforced and form part of the structure. The surface coating should be as thin as possible.

I would suggest that a suitable form of decoration would be a kind of sgraffito work done in this manner. The mould to be formed of plaster of Paris or other smooth surface, coated with shellac, to prevent adhesion, and having pieces of the form of the sunk ornament about ½ in. thick applied thereto in the proper positions. Then render over the inside of the mould with a coloured mortar flush with these applied forms. This coloured mortar will form the main surface of the member when finished; then float over the whole inside of the mould with another coloured mortar, which will form the sunk surface of the ornament; and then put in the concrete and reinforcement, taking care not to push any stones through to disturb the surface. If more adhesion were required between the layers of mortar and the concrete, wire or rails could be stuck into the mortar at intervals from the back as the concrete was being put in.

In cases where only a plain surface is required, it may be formed as soon as possible after the removal of the falsework by the application of a rendering with a float, or by splashing it on from a brush to give a roughened surface; or a mortar may be used with fairly large and coarse sand grains, which would leave a rough surface. Mortar applied as rendering should be of much the same richness as the concrete, otherwise the expansion and contraction will be different, with the risk of the surface becoming detached.

Another method which it seems to me would be quite a satisfactory one for buildings, especially in towns, would be to have the surface formed of faience blocks shaped at the back to connect more rigidly to the concrete. These would be placed in the falsework with small pieces of card or felt in the joints, and the reinforcement and concrete filled in behind in the usual way. This method would have this advantage, that the timber falsework would not need to be quite so carefully and expensively formed, as it has only to hold the faience blocks, it does not come in contact with the concrete; it could, moreover, be soon struck. My idea in suggesting pieces of card or felt in the joints was to keep the joints between the faience blocks open, so that, even if a slight settlement of the structure occurred, no weight would be thrown on the faience. Of course these strips would afterwards be removed and the joints pointed up in cement. This is only a variation of the Roman methods already described.

Another treatment which has been adopted is to form the necessary beam and stanchion treatment in reinforced concrete, and to build the wall screens in the panels in brickwork or other suitable material. With that, I think, my suggestions come to an end.

I can only hope by these few suggestions to have somewhat stimulated your interest in a very large subject. Little has, as yet, been done to demonstrate the æsthetic possibilities of reinforced concrete; but I hope that, when you have the opportunity of erecting buildings in this manner of construction, you will do all you can to invent a suitable artistic treatment, and that it will not be allowed, either by architects or engineers, to be merely a cheap and always ugly, or else hidden, method of construction."

Mr. Markham's paper was followed by the exhibition of a series of lantern slides illustrating buildings that had been erected in ferro-concrete, with some comments. It would be of no use to report these apart from the illustrations, but we give two of them from photographs lent to us by Mr. Markham. Fig. 1 (p. 114), the elevation of a building in San Francisco, is an example of the treatment of a building of this class with well marked vertical piers, between which square openings are formed for windows. Fig. 2 (p. 115) shows a Market Hall at Breslau, which is a good example of a simple but effective looking structure. The surface of the concrete was picked over with a hammer to get rid of the marks left by the boarded centering, the natural grey colour of the concrete being left as a ground. The outlines of the arch-shaped principals are accentuated by a slight decoration in colour, with very

good effect; stencil ornament in waterproof paint. The feet of the principals (which are about 56 ft. span and 50 ft. high) have a casing of sheet iron at the base, and iron angles for a height of about 6 ft. The work was carried out by Herr Carl Brandt, of Düsseldorf, the engineer being Herr Rudolf Hein, of Breslau.

Fig. 3 (p. 116) is an illustration of a bridge at Oroville in California, of which J. B. Leonard was the engineer; it is a good specimen of concrete applied to bridge design.

Mr. Matt Garbutt, in proposing a vote of thanks, said that Mr. Markham had touched very well on some of the principles which might govern attempts at treating this material in an architectural way. One felt, however, that more might be made of it in large structures than in small ones. The question of cost could not be overlooked, and in small structures the temptation to reduce cost by reducing the thickness of the covering the steel would receive must be rather dangerous. Concrete specially made for the purpose would stand very well, but that it would altogether resist the weather was hardly to be hoped. From the examples one had seen of Portland cement concrete work, it was clear that it deteriorated somewhat as stone did, but to an extent that must vary very much in individual cases. That difficulty rendered the use of a very thin covering most undesirable, and he thought that in any case where a very small amount of concrete had been put between the weather and the steel work the buildings would suffer sooner than the designers seemed to think. One way to get over that difficulty was to make exterior faces in some form of veneer, but, while that might be a legitimate method, it could hardly be called a direct ferro-concrete treatment. It seemed to him that the appropriate uses of the material were in big structures, where the thicker covering could be given to the steel of the exterior, and then the cement could be left with its own face just as it left the false work. They had seen illustrations of a good many examples of buildings erected in this material, and apparently the difficulty of the absence of any precedent had been felt by most designers. Most of the works erected were imitations of stonework and nothing else, and, as the lecturer had said, that was not "building in truth." As to the design of columns and members of that sort, the lecturer referred to the Corinthian column as not being fitted for imitation in this material. Well, perhaps the cap of the Corinthian column was not a truthful structure at any time; from the beginning up to now it was a case of ornament planted on to the structure, and not forming an essential part of it. But he was inclined to think that on principle a distinct cap and base to a ferro-concrete column might not be inappropriate. As had been pointed out, there were hoop stresses to resist, and to resist those stresses it would not be unreasonable to put a bronze hoop round a circular column. Most of the columns they had seen illustrated that evening had been square on plan, and that, he took it, was simply because it was easier to make the falsework of flat boards than anything else. Otherwise a circular column would appear to be more satisfactory.

Mr. E. O. Sachs, in seconding the vote of thanks, said he should like to hear Mr. Statham's remarks on the subject after his recent experience in connexion with the *Builder* competition for a clubhouse façade in ferro-concrete. That competition, he believed, had done a great deal of good in interesting architects in the treatment of reinforced concrete. He thought it was time that the Association considered the desirability of putting into its curriculum a systematic series of lectures or classes on reinforced concrete. Those students who were now in the classes of the Association would, all being well, be in practice themselves in ten years time. In ten years time, judging from the speed with which knowledge of the material was progressing, it would be the business of every architect to know a great deal about the subject. The sooner they studied the subject thoroughly and tried to avoid doing their work in an amateurish manner the better for them as architects. Reinforced concrete had come to stay, and what they had seen on the screen of examples from the United States and the Continent and at home told them that there was a great deal which was to be learnt both from the point of view of architectural rendering as well as from that of structural design. Of the various decorative treatments discussed, he had a great liking for sgraffito. That treatment, which seemed to have become almost lost at the present time, seemed to lend itself particularly well to the surface treatment of reinforced concrete, and it was a treatment which called for study. He thought there was too great a tendency always to specify this or that system of reinforced concrete. This and that system of reinforcement was getting a little tiresome. Let architects take up the design of reinforced concrete much as they would design in steel framework and evolve their own schemes based on the ordinary principles of design. As it was now, the system by A or B or even some patented system was adopted *in toto*, irrespective as to whether it was suitable to all parts of a structure or not, and he did not think that was desirable. He was glad to hear that three of our great railway companies were taking up the matter of design in reinforced concrete as a special section of their engineering department, and that in a well-known architect's office there were two or three men specially engaged on the subject, with the result that nobody's system was adopted as a whole. Some feature of a special system applicable to a special detail might be applied, and, if a patented feature, a royalty would be paid thereon. Again, some special patented bar might be specified for some special purpose, but, generally speaking, only the ordinary methods were employed. Architects were grateful to those who had brought the various systems before them from the United States and France, and they had done a great deal of pioneer work, and everyone was glad of what had been done by them; but he thought the owners of systems and patents would benefit far more if architects did their own designing in reinforced concrete and specified the reinforced concrete specialist contractor just as they did any other specialist. They should be selected for good workmanship, care, experience, and so on. The system owner, on the other

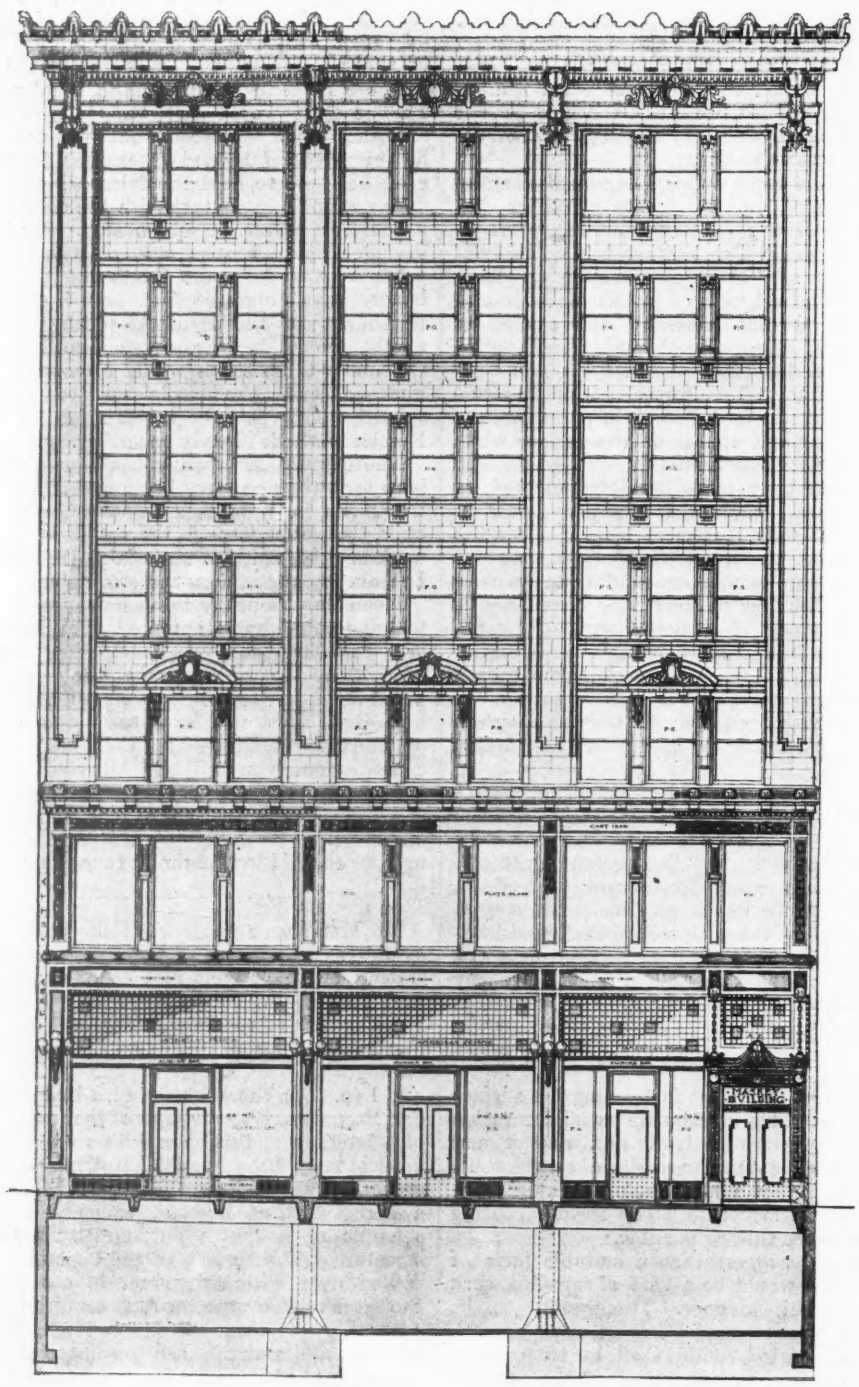

Fig. 1. *Elevation of Maskey Building, San Francisco.*

Fig. 2. Market Hall, Breslau.

hand, would become a specialist consulting engineer whom architects would consult on payment of fees.

Mr. H. H. Statham said he desired to support the vote of thanks not only for an excellent paper, but for the excellent way in which it was delivered. The paper, however, produced rather a melancholy effect on him when he saw the lantern views of the various attempts of what was supposed to be the architectural treatment of ferro-concrete; and it only showed how very difficult it was, in dealing with material and construction entirely different from what they were used to, for the architectural mind generally to free itself from precedent and to evolve anything which grew naturally out of the construction. He was not enthusiastic about the material himself, but if it had come to stay—he would rather it did not—he felt sure that anything which could be called architectural treatment was entirely in its infancy. They did not seem to have come to anything like a new treatment arising out of the use of the material in any of the illustrations shown except in the one designed, presumably by Mr. Markham, and as to which the audience testified their approval. The interior of a railway-station had been shown with something that looked like ordinary roof trusses several times the usual scantling. It was most ugly, and he would much rather see a steel roof in slender proportions. One reason for the unsatisfactory proportions of that roof was that it was of mixed construction, which they did not see although they knew it. The work looked like great lumps of concrete—which as lumps of concrete merely would be useless—with the tensile members entirely hidden. The impression given was of something like a timber roof of very exaggerated and clumsy dimensions. In the treatment of street buildings also there seemed to be an inability to get out of the stone precedent or tradition, and if anything was to be made of the material in a truthful architectural way, they would have to try more and more to shake off the stone tradition—to try and think of the thing as something entirely new, and to say, "Supposing I had never done any architectural work before, and I came to this construction and tried to make something beautiful of it, what should I do?" It was a difficult position to take up, but until they did that and put aside everything they had learnt, and began over again, he did not think they would make anything like truthful architecture with the new construction. He should like to ask a question as to the real value of the corrugated bars, about which he had heard a good deal of difference of opinion. He attended some tests of ferro-concrete some time ago, and his impression was, contrary to his expectation, that the cylindrical steel rods had an extraordinary hold on the concrete, and that it was unnecessary to jag them to prevent them pulling through. They did not seem inclined to do that at all.

Mr. J. E. Franck said ferro-concrete was a new material, and it would be some long time before we got a really satisfactory external treatment in it, and it was altogether wrong to go on treating it as though they were erecting a stone building. A rear view of the new General Post Office was shown, and that looked rather well. In that building they saw the columns carrying the floors, and in the same way in many factory buildings they saw the minimum of stanchion and beam work, and he thought that if one used perhaps a little more concrete, and got a T-beam treatment for the uprights and stiffened them a little, and made them a little deeper in the floors, they would get a much more satisfactory treatment. Ferro-concrete was to be treated as a monolithic construction, and he did not think it was the right treatment to put up stanchions and simply fill them in. He thought the treatment should be a panel treatment. He had tried treating some ferro-concrete work, where used externally, with aniline dye, but he did not know how it would turn out. Broken brick was a good material for part of the aggregate, carefully screened, using dust before the concrete was put on. When they came to the external treatment, forming a covering with tile or mosaic, they had to be very careful. It was different from Roman concrete, and they would find they wanted a much richer cement and that they did not get the right adhesion.

Mr. A. E. Munby said that although Mr. Statham thought the material had not come to stay, he (the speaker) thought he was wrong.

Mr. Statham said he had only expressed a hope that it had not.

Mr. Munby said that when the new London County Council Bill was passed they would find that ferro-concrete had come very much to stay. When one had an expensive site, if the walls could be reduced in thickness and the floor space increased, a client would naturally be anxious that this should be effected, as it meant a reduction of rent per unit area. As to style in ferro-concrete work, he thought a great deal was due to Mr. Markham for his suggestions, because it was difficult to know what course to adopt. Usually one of two things was done: Either a Renaissance design was prepared, which was often unsuited to the plan, or we got mutilated classical forms. It was quite evident that the styles as we are used to them were not suitable to these new forms of construction, and we should owe something to anyone who evolved something new. As to the scientific aspect of the subject, there was a great deal to be learnt, for he did not think one could say we knew all about it. Even as to the concrete itself the true nature of setting was not settled yet, and there were two schools of thought which were entirely antagonistic—the one

led by Le Chatelier held that the setting was due to crystallisation, the other led by Michaelis held that the drying up of gelatinous silicates was the cause of setting. It was desirable that someone or some society should work on these and other lines, but scientists in this country were doing little in this direction. [A member: The Concrete Institute are.] He did not think they were taking up the purely scientific side of the question. Perhaps the matter would be taken up if they showed what was wanted and what ought to be done. As to the fineness of the cement and the aggregates, that was very important. Very often the fine cement was wasted after a high price had been paid for it, the aggregate being unsuitable. The aggregate should consist of as large pieces as possible, for then they got the greatest natural cohesion and the greatest strength for the outlay, for the cohesion of the aggregate was inherent, whereas the adhesion of the cement had to be paid for. There were many other questions which might be considered in relation to reinforced concrete, such as tenders and what quantity surveyors were to do in the case of extras and so on; but probably Mr. Markham would be able to give them another lecture on the subject.

The Chairman, in putting the vote of thanks to the meeting, said the difficulty as regards design was that architects really knew very little about the material, and until they had mastered the construction and understood what they were dealing with they would never be able to design in it. Up to now reinforced concrete design had been in the hands of engineers, and had been handed over to the architect to deal with when the construction had been worked out for him, and he had to put the best face he could on it. As Mr. Sachs had said, they ought to start a reinforced concrete class in the Association, and no doubt that would be done. The only way for an architect who had to design in a given material was to understand the material, and at present a great many things had to be got used to in the matter of ferro-concrete which were quite outside their view and looked absurd to them—those elongated columns, the tremendously deep beams, were features which looked to them abnormal. It was the same with the pneumatic tyre for the motor-car, which looked absurd when it came on the market, until people became accustomed to it. When the architect understood the material he could treat it in an entirely different way and could make it suit his requirements—make it more elastic and suitable.

The vote of thanks having been heartily agreed to,

Mr. Markham, in reply, said as to what Mr. Sachs had said about special systems he should be glad to drop the names of the patentees of those systems; but if one attempted to disregard their claims a high hoarding would be required to prevent people seeing what was being done. The various patentees were keen about maintaining their rights; and anyone who carried out reinforced concrete work without ascertaining whether he was using a patented system or not ran considerable risk. Still, it was the greatest nuisance having these systems, which hampered one in every direction. As to the Corinthian cap, he had no objection to it; but what he meant was that there was a straight top line, and no ornament could run $\frac{1}{8}$-in. beyond that. They ought not to be bound, as they were in stone buildings, by hard-and-fast joint lines. As to the *Builder* competition, in the winning design, which he liked very much, although it did not illustrate his ideas of what ought to be done, the treatment was almost a matter of casing. It might have been steel frame or anything else. When the competition had been going on for some time he prepared a design showing a brick panel treatment with reinforced concrete structural members, because he thought that was the best method. He had tried to design a capital which would not be bound by hard-and-fast lines, and he let the ornament go from the column on to the beam; but the design could not be considered successful. He had shown that there was necessity for an extra amount of concrete in the underside of beams near the supports, and that suggested a broad bracket cap; this he also tried to introduce into his design. It was, of course, open to any architect to handle this kind of treatment properly if he could. As to Mr. Statham's question about the corrugated bar, his (the speaker's) opinion was valueless. It was said that the Ransome bar was strengthened by being twisted, but otherwise there would not seem to be any necessity for a corrugated bar unless some cause were present which was specially likely to produce rupture of the adhesion. He quite agreed with Mr. Munby that the aggregate should be as large as possible to get the natural cohesion, provided it be not so large that the pieces would not pass easily between the various reinforcements and between the reinforcement and the centring.

The Chairman said that the next meeting will be held on February 5, when Mr. H. T. Buckland will read a paper on "Schools."

The meeting then terminated.

THE SURVEYORS' INSTITUTION:

THE ORDNANCE SURVEY.

AN ordinary general meeting of the Surveyors' Institution was held on Monday, at No. 12, Great George-street, Westminster, S.W., Mr. Howard Martin, President, in the chair, when Col. Sir Duncan A. Johnston, K.C.M.G., late R.E., read a paper on "The Ordnance Survey."

The lecturer said the Ordnance Survey consists of two classes of maps, topographical and cadastral, and he should confine his remarks mainly to the latter class—by which he meant large scale maps suitable for property purposes—which had for many years formed the basis of the topographical maps. The author first gave a brief historical sketch of the Ordnance Survey, then described how the Cadastral Survey of Great Britain was made, and lastly showed how the maps were being revised.

The works of the Ordnance Survey might be said to have commenced in 1784 with the measurement by General Roy of a base line on Hounslow Heath as a preliminary to a triangulation to connect the observatories of Greenwich and Paris. In 1791 Parliament ordered a trigonometrical survey of England; and since that date the Ordnance Survey has been continuously employed on the survey and the revision of the survey of Great Britain and Ireland. In 1797 it was decided to base a 1-in. survey on this triangulation. The name, "Ordnance Survey," arose from the fact that the national survey at the start, and for many years after, was under the Board of Ordnance. The survey was at first a military one, carried out by officers and soldiers of the army. As time went on these were supplemented by civilians, still known as "civil assistants." Subsequently the Ordnance Survey was entrusted with the preparation of maps for civil purposes. The direction of the Ordnance Survey has been entrusted to officers of the Royal Engineers. At present three complete companies of Royal Engineers are employed on it, but the majority of the employees are civilians, many being old soldiers.

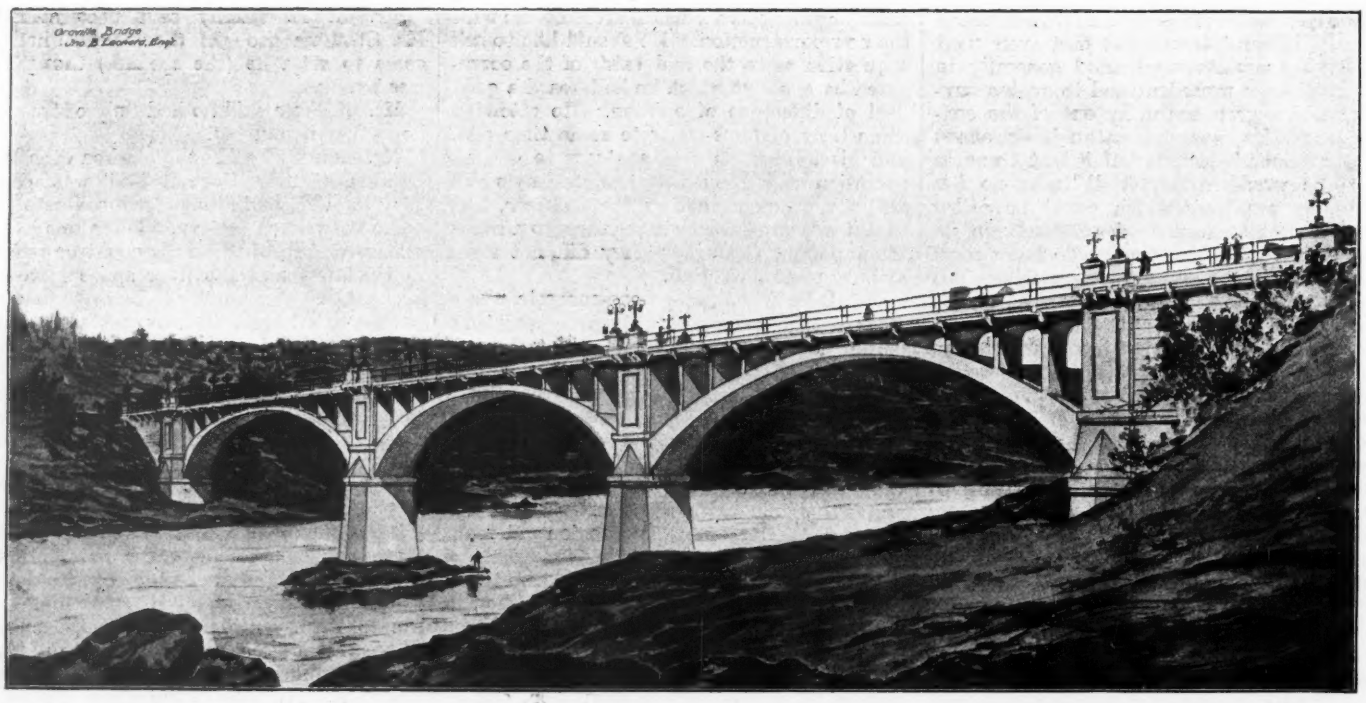

Fig. 3. Design for Bridge over Feather River, Oroville, California.

As to the primary triangulation, he alluded to the special difficulties to be overcome in a country like ours, where the air is rarely clear, and where woods, buildings, etc., intercept the line of sight. To enable reciprocal observation to be taken, scaffolding had often to be resorted to, and some of these were skilfully constructed; such as Norwich Cathedral (1843), Thaxsted Church (1844), and St. Paul's Cathedral (1848). In each case the scaffolding which carried the instrument was entirely separate from that which carried the observers so as to obviate the risk of vibration to the instrument from the movement of the observers. The instruments principally used were two 36-in. theodolites by Ramsden—one of which is at the South Kensington Museum. The accuracy of these instruments was at the time considered wonderful, although in the present day 10-in. micrometer theodolites could be got which were much more accurate than these cumbrous instruments. The largest line of the primary triangulation was from Sca Fell to Slieve Donard, 111 miles. One could imagine the difficulty of picking up this line in a climate like ours.

That this work was accurate was shown by the fact that the measured length of the Lough Foyle base line differed from the calculated length, as obtained through the long series of intervening triangles from Salisbury Plain, by almost 5 in. only. The other base lines also gave very good results. The original 1-in survey commenced in 1797, was proceeded with from south to north till 1824. In that year a map of Ireland on a larger scale being required for land valuation purposes the surveyors were transferred to Ireland. By 1840 a 6-in. survey of Ireland had been completed, the towns having been surveyed on the scale of 5 ft. to the mile. These larger scales were found so useful that it was decided to adopt them for the unsurveyed portion of Great Britain, and to complete the 1-in. scale map by reduction from the 6-in. scale. Subsequently a demand arose for even larger scales for property purposes, and after what had been termed "the battle of the scales" it was definitely settled in 1858 to adopt the following scales:—

"$\frac{1}{500}$ or 10·56 ft. to the mile for towns of over 4,000 inhabitants.

$\frac{1}{2500}$ or 25·344 in. to the mile for all except uncultivated areas.

$\frac{1}{10560}$ or 6 in. to the mile for the whole county.

$\frac{1}{63360}$ or 1 in. to the mile for the whole county."

These scales had been adhered to ever since, and with the exception of the $\frac{1}{500}$ scale, were periodically revised. Maps on the smaller scales of $\frac{1}{2}$-in., $\frac{1}{4}$-in., $\frac{1}{10}$-in. to the mile, and $\frac{1}{1000000}$, had since been published. The author then described the methods adopted in the original cadastral survey of Great Britain and still used in all essentials in the resurvey of Ireland.

Triangulation.

The first preliminary to the survey of a district was to make a secondary and tertiary triangulation based on the primary triangulation. The lines of the secondary triangulation were rarely over 20 miles long, and were generally very much shorter, those of the tertiary triangulation were rarely over 2½ miles long, and were generally very much less, while in towns the points were even closer together. So far as he knew, no other national survey was based on a complete triangulation of all three orders, and this triangulation gave a more accurate framework for the survey than could be obtained in any other way. While the minor triangulation did not present the same difficulties as the primary, it still tested severely, especially in towns, the skill and ingenuity of observers. Not the least of the difficulty was due to the thick atmosphere of our towns.

Chain Survey.

When the triangulation was complete a chain survey was based on it. No other country had a general survey made by right line chaining, partly, no doubt, because no other country had a general survey on so large a scale as ours. With the checks employed on the Ordnance Survey, and on the large scales adopted ($\frac{1}{2500}$ and over), a chain survey gave excellent results. The successive checks used on the Ordnance Survey had led to subdivision of labour, which enabled the different operations to be carried out by men of comparatively moderate attainments. They had proved efficient and economical, but they entailed the drawback that the time between the commencement of the survey of an area and its completion was long.

The method of working was as follows: "A number of surveyors are formed into a party under a superintendent, who is supplied with a diagram of the trigonometrical points of his area, and with 'descriptions' of each point, so that if the pole is down the exact position of the point may be found. The superintendent allots to each surveyor a block or triangle, and traces on the ground with a theodolite the main lines and one or two split lines so as to ensure these lines being straight. He leaves pickets where these lines intersect any hedge, wall, or other detail. The surveyor having no knowledge of the computed lengths of the main lines chains them and the split lines, entering his measurements in a field book, and sends his measurements in to the office to be tested. In the office the lengths of the main lines and the co-ordinates of the trigonometrical points having been obtained from the trigonometrical branch, the points are accurately scored on the plans. If the chained distances agree with those laid down and plotted on the plan within a passing error of 2 in 1,000 they are passed, if not they are returned to the surveyor who re-chains them until he gets them correct enough to pass.

When the main and split lines have been passed, the surveyor makes a chain survey of the detail of his triangle or block, entering his measurements in a field book, in which also he makes a diagram of his lines. He runs his lines as close as possible to the detail to be surveyed, especially to junctions of fences, to houses, etc., and fixes the position of detail by offsets taken at right angles to the line chained. The chaining requires considerable skill. The lines must be kept perfectly straight, a difficult matter in uneven ground, and the chain must be kept neither too tight nor too loose. Chaining is generally horizontal, and when chaining down hill the chain (or part of it) is held horizontal, and an arrow is dropped to mark the horizontal distance chained. A similar course is used when chaining up hill. In very steep ground, such as in parts of the Highlands of Scotland, surface chaining had to be resorted to; the vertical angle of the surface was taken with a theodolite, the measurement being afterwards reduced to the horizontal by calculation in the office. Traverse is rarely resorted to, usually only in dense woods and places where lines cannot be got through. The ingenuity of ordnance surveyors in getting lines through houses and other difficult places is very great. The field book when completed is sent in to the division office to be plotted. Any lines which do not lay down within the passing error of 2 in 1,000 are sent back to the surveyor to be rechained. . . ."

Plotting and Projection.

When the lines of all the triangles of a plan had been passed the field books were given to a second line plotter who laid down the lines independently on a fair plan. The lines so plotted were compared with the original plotting, known as the "plot," as a safeguard against possible errors in line plotting. When these agree the field books and fair plot were handed over to a third plotter, who plots the detail.

The cadastral maps were on what was known as the rectangular tangential projection, *i.e.*, a central point having been selected for a county or group of counties the plan lines were drawn parallel to north and south and east and west lines drawn through that point. It was originally the practice to have a separate meridian for the cadastral maps of each county. Later the inconvenience of so many meridians having made itself felt several counties were placed on the same meridian, the limiting consideration being the amount of divergence of the extreme east and west plan lines.

A 6-in. sheet was a rectangle of 36 in. by 24 in., and represented 24 square miles, or 15,360 acres. In England and most of Scotland the 6-in. was now published in quarter sheets. The 6-in. sheets were numbered separately in each county. The 6-in. sheet was divided into sixteen equal rectangles, numbered 1 to 16, and each of these rectangles represented the area of a $\frac{1}{2500}$ scale plan, which measured approximately 38 in. by 25 in., represents 960 acres, and was identified by the number of the 6-in. sheet and by that indicating its position in the 6-in. sheet. Similarly in towns each $\frac{1}{2500}$ scale plan was divided into twenty-five equal rectangles, each of which represented a $\frac{1}{500}$ scale sheet, which measured approximately 38 in. by 25 in., and represented an area of 38·4 acres.

Field Examinations.

The work was checked in the field by what was known as field examination. The plotted plan was traced in the office on tracing-paper, and was sent to a field examination party, usually consisting of a superintendent and three or four examiners. Field examination generally took place three or four months after the survey, and the party was entirely independent of the survey party. An examiner was rarely employed as a surveyor, and no man was allowed to examine work he had surveyed. The examiner used methods entirely different from the surveyor, working by a system of intersections and productions and checking the closing distances with a tape. He carefully tested, and, if necessary, corrected the detail. But he did much more than this; he supplied all detail not shown by the surveyor, such as bridle roads, permanent footpaths, rocks, slopes, details of railways, bridges, etc., etc.; in a word, all that was necessary to make a perfect representation of detail according to the scale of the survey. He indicated on his tracing the exact area and character of woods, orchards, parks, marshes, etc., and identifies parish and other boundaries from information supplied him. He also supplied all names which should appear on the plan, entering them in a name book, with a description of the object, its position, and the authorities for the name. He investigated and identified all well-authenticated antiquities and places of historical interest. Special care was taken to obtain the best possible authorities for names and antiquities. The examiner inserted on his tracing the information necessary for the computation of areas, viz., the nature of the ground, whether arable, pasture, moor or other, and defined the limits of parcels as he would recommend that they should be computed.

All roads and footpaths which were clearly and permanently marked on the ground, whether public or private, were shown except in small gardens. The examiner made his alterations and additions on the tracing in red, so as to distinguish them from the black plotted detail.

The examiner, having completed and signed his tracings and name sheets, handed them to his superintendent who tested the detail so as to satisfy himself that the work had been carefully examined. While the superintendent was not responsible for every small detail, he so far tested the work as to make sure that no serious errors existed. He submitted the names to landowners, agents, etc., specially investigated names, the form of which was doubtful, he made inquiries as to antiquities, and obtained evidence as to disputed boundaries when necessary. He made his alterations on the tracing in green, so as to distinguish them both from the detail as plotted, and from the examiners

alterations. When he had completed the work, the superintendent sent in the tracings and name sheets to the division office, where the fair plans were drawn.

Drawing.

For many years past the fair plans had been drawn for reproduction by photography, which required very careful drawing. The outline must be firm and even, and absolutely black—if at all gray it would not photograph well, and the paper must be quite clean. Before drawing, the examination tracings were laid in position on the plotted plan, and alterations were transferred to the latter with the help of carbon paper. The outline having been inked in, all names and numbers were typed. Typing secured uniformity in lettering, and needed less skill than writing. Trees, wood, orchards, marshes, etc., were stamped in conventional character; such stamping was much quicker, and more uniform than hand work. The plan was then handed over to a plan examiner, who carefully compared the plan with the tracings, name sheets, and boundary documents. He noted all doubtful points, and these, with questions as to areas, were referred to the field superintendent who finally examined the work, who, if necessary, revisited the ground before reporting.

Computing.

After drawing was completed the plans were passed to the computing department. Each parcel which was large enough was given a separate reference number, a separate series of reference numbers being given to each parish. Very small parcels, such as yards near houses were not given a separate number, but were braced to and computed with the parcel to which they appeared to belong. Parcels which fell on more than one plan, known as "broken parcels," were numbered on the plan on which the largest part of the parcel fell. The areas were computed by scale. Each plan was computed separately, and the sum of the parcel areas, including "broken parcels" should close to the total area of the plan, viz., 960 acres. The areas are then compiled in an area book and the areas are equated, or, as it was usually termed, "closed," so that the whole of the areas on a plan mounted up to 960 acres. When all points had been settled, the plans were signed by the division officer and sent to the levelling division.

Levelling.

The Ordnance Survey levelling was based on lines of primary levelling executed with the greatest possible accuracy. Small discrepancies in the value of heights as obtained by different lines of primary levelling were worked out by Captain A. R. Clarke, F.R.S.,R.E., by the method of least squares; this involved in England the solution of equations with 91 unknown quantities. The levels were referred to a datum point at Liverpool representing mean tide as ascertained there in 1844. It had since been ascertained that this Liverpool datum point was 0·068 ft. above mean sea level.

The levelling division having been notified when to expect the plans should have carried out the requisite levelling. It was usual to have 1½ miles of levelling on each $\frac{1}{2500}$ scale plan. On receipt of the plans by the levelling division the bench marks and surface levels were plotted and typed on the plans, which were then sent to Southampton, where the completed plans were examined carefully by very experienced examiners, and a fresh and independent computation of areas was made.

When all doubtful points had been settled, the parcel areas were stamped on the plans, which were then sent to be published.

The Revision of the $\frac{1}{2500}$ Scale Survey.

The face of the country was constantly altering from artificial and natural causes. New roads and buildings were made, enclosures were subdivided or altered, new railways were constructed, the coast line and rivers altered, etc., etc., and in time the maps ceased to represent the country as it existed. The Treasury, therefore, sanctioned in 1886 a revision of the $\frac{1}{2500}$ scale maps every twenty years, but this revision could not be commenced till 1894. In Great Britain the original survey was completed towards the end of the last century, and the work of the Ordnance Survey was now that of periodical revision of the maps. For purposes of revision Great Britain was divided into districts in each of which a field division was quartered. Before the revision of a county was commenced it was visited by an officer who decided what parts should be re-surveyed. Re-surveying was taken in hand rather in advance of revision. Usually a block survey was made, *i.e.*, the surveyor cut up his work into blocks and fixed accurately in each block only sufficient detail to enable the reviser to fill in the remainder. Field revision was carried out on tracings prepared by heliozincography from the most recent MS. plan, at the same time a blue impression is printed on Whatman's hand-made paper to form the new or revised MS. plan. Special precautions were taken to get the tracings and the new MS. plans as correct to scale as possible—a very difficult matter.

The tracings were sent out to a revision section, consisting usually of a superintendent and three or four revisers. The reviser's first care on proceeding to the ground was to ascertain how much old detail remained unaltered on his tracing. He tested the old detail so as to ascertain what remained and what had been altered. He cancelled the latter on his tracing and proceeded to insert the new detail by methods similar to those used by examiners in the original survey. The insertion of simple alterations and additions presented little difficulty, and where alterations were very large a re-survey was usually made, with the help of which the reviser can easily supply all new detail. But intermediate between these, cases existed in which considerable blocks of new detail had to be supplied, *e.g.*, a new factory. In such cases the reviser selected points of old detail, the position of which he found after careful testing to be correct, and from them ran a small chain survey which he plotted on his tracing and checked by methods used by field examiners. The reviser marked on his tracing the classification and nature of all roads, bridle-paths, and foot-paths. He completed his tracing by filling in minor detail, ornament such as woods, etc., names and antiquities, and gave information required by the computers, in a manner similar to that used by field examiners in the original survey. The reviser inks in new work and alterations in black so as to be easily distinguishable from the original detail which was in red.

Final Field Revision.

The reviser having completed and signed his tracings and name sheets handed them to his superintendent, who finally revised them or handed them to an experienced reviser for final revision. Final revision was similar to the final examination of the original survey, but it was the final reviser's duty so to test the detail that no serious error could remain undetected. When completed the tracings and name sheets were sent in to the division office.

Revision of Areas.

As to the revision of areas, the plan was first gone over carefully to ensure that braces had been inserted so that there was no doubt as to the extent of any enclosure. The plans of a parish were taken up, and the parcels were numbered by parishes. This was done consecutively as far as possible. For the convenience of the public the original reference numbers were retained where they applied; the obsolete numbers were cancelled, or where it could be conveniently done, were used for new or altered parcels; in other cases old numbers were used with the addition of a letter. This did not avoid occasional gaps in the numbers. Where the alterations in a parish were so numerous as to render the old numbering practically useless, the parish was re-numbered on revision. In order, therefore, to ensure that a parish reference number identified an enclosure perfectly, it was necessary to specify not only the number and parish, but the date of survey or revision of the map. In revision the areas of unaltered parcels were left unchanged. The areas of the new and altered enclosures were computed and equated to the acreage of the old parcels covering the same ground. The new and altered enclosures were computed by two independent computers, and if there was any material difference between them a third independent computation was made.

Revision of Levels.

Re-levelling was only resorted to in mining districts or other places in which there had been a general subsidence of levels. Elsewhere the levels were "revised," *i.e.* bench marks which had been removed or disturbed were replaced by others so far as needed to give each $\frac{1}{2500}$ scale plan its full proportion of levelling, viz. 1½ miles. In carrying out such levelling it was usual to start from two undisturbed bench marks and to close on two other undisturbed bench marks. The new levelling having been calculated the levels were plotted and typed on the plans which were then sent to Southampton for examination. After examination at Southampton the plans were returned to the division where all doubtful points were settled, the areas were stamped on the plans which were then returned to Southampton for publication.

When it was remembered that the Ordnance Survey published between 90,000 and 100,000 different maps, the errors would be found very few in comparison with this enormous amount of mapping.

A discussion followed, and a hearty vote of thanks was accorded to the author for his paper.

PRELIMINARY EXAMINATION.

The following candidates have satisfied the examiners:—

T. S. Ashworth, Radcliffe, Lancs.
N. Baines, Maida Vale, W
J. M. Balls, Castle Hedingham.
C. R. Bell, Tarporley, Cheshire.
F. R. L. Bell, Westlinton, Carlisle.
E. H. Berry, South Croydon.
A. R. Beveridge, Woodside Park, N.
H. J. Binks, Willesborough, Ashford.
J. C. Bland, jun., Colchester.
F. R. Booker, Nottingham.
H. P. P. Brunel, Woolston, Southampton.
E. Butler, Southall.
H. R. Carnaby, South Shields.
C. F. Chambers, Hornchurch, Essex.
H. R. Cholmeley, Brook Green, W.
W. L. Clowes, Newcastle-under-Lyme.
H. W. Coales, Market Harborough.
J. S. Collins, Purley, Surrey.
L. K. Collins, Moseley, Birmingham.
M. J. Cotton, Bromsgrove, Worcestershire.
*A. R. Coucher, Maida Vale, N.W.
J. Darling, Scone, Perthshire.
G. R. Davis, South Kensington, S.W.
S. J. C. Dening, Barnstaple.
E. Dilley, Finchley, N.
T. W. Dowsett, Southend-on-Sea.
W. G. Elms, Brixton Hill, S.W.
A. J. Fawcett, Salisbury.
O. Featherstone, Croydon.
A. W. Flood, Camberwell, S.E.
W. H. Forder, West Ayton, S.O., Yorks.
R. R. France, Shortlands, Kent.
G. P. Gibson, Acton, W.
F. A. Gill, Exeter.
S. E. Gillett, Sutton.
S. V. Gledhill, Southend-on-Sea.
H. L. Goddard, Woking.
D. N. Gow, Neasden, N.W.
D. Gregory, Colwyn Bay.
E. M. Gregson, Southport, Lancs.
W. R. Guilford, Tunbridge Wells.
A. H. Hack, Dorking.
E. L. Harman, Croydon.
J. L. Hennessy, Bath.
S. Hill, Spennymoor.
R. Hinxman, Winchester.
W. W. B. Holton, Gower-street, W.C.
W. S. Hooker, Croydon.
J. H. Houghton, Teddington.
J. H. Hughes, Maidstone.
L. Hughes, King's Norton.
W. D. P. Hughes, Pwllheli.
E. A. Ireland, Putney, S.W.
F. S. Jasper, Bromley, Kent.
F. B. Jones, Newport, Mon.
W. E. Jones, Muswell Hill, N.
A. L. Kingston, Barnes, S.W.
C. J. L. Langlands, Epsom.

* Passed head of list.

E. L. Law, Waterfort, Manchester.
L. S. Lee, Doughty-street, W.C.
R. L. G. Marix, Norfolk-square, W.
E. F. Nash, Gerrard's Cross, Bucks.
B. D. Nix, Royston, Herts.
G. E. Orton-Smith, Harborne, Birmingham.
K. C. Parker, Sutton, Surrey.
A. J. Penaluna, Dartford.
B. Petley, Norwich.
W. R. Phillips, Brondesbury, N.W.
E. A. Pilgrim, Herne Hill, S.E.
G. E. Portal, Hungerford, Berks.
W. E. Powell, Bideford.
E. A. Price, Woodside Park, N.
C. Reid, Liverpool.
W. M. Robinson, Carlisle.
B. J. Ryan, Hampstead, N.W.
R. J. M. Skarratt, Cheltenham.
R. H. Skipper, Norwich.
A. F. S. Smallman, Wimbledon Common, S.W.
F. Teare, Peel, Isle of Man.
R. Temple, Westgate-on-Sea, Kent.
L. R. Thomson, Catford, S.E.
C. P. Townsend, Maidenhead.
G. W. Turner, Bentley, near Ipswich.
A. C. Underwood, Fairfield, Liverpool.
R. S. Wade, Lordship-lane, S.E.
F. Ward, Bere Alston, Devon.
J. W. Warren, Clifton, Bristol.
G. H. Webb, Aldershot.
C. J. M. Welch, Dunmow, Essex.
G. S. Wells, Prestatyn, N. Wales.
B. White, Greenodd, Ulverston.
J. O. Wicker, Carshalton.
C. H. Wickham, Exeter.
H. N. Wilford, Kettering.
S. Youngs, Willesden Green, N.W.

PICTURE EXHIBITIONS.

FINE ART SOCIETY.

AT the Gallery of the Fine Art Society is a rather interesting collection of pictures by "A Quartette of Roman Painters" whose work is not much known here. One of them, E. Coleman, is an Englishman by name and partly by descent, his father, Charles Coleman, having come to Rome in the early part of last century and remained there, painting the Campagna and its cattle, and married an Italian lady.

His son, Enrico Coleman, paints Campagna landscapes well. C. Innocenti, the son of an architect, paints figures, for which we do not care very much, though there is a good deal of character in some of them. U. Coramaldi, the third of the group, is chiefly occupied with very clever studies of animals, painted in a broad and free style. The most interesting to us are the works of the fourth member of the group, V. Grassi, who paints architectural subjects mostly on a small scale and in a low scheme of colour, but with a style distinctly his own and very effective. One of his larger drawings, "The Eighteenth Century: Trinitá di Monte," is simply a study in perspective of a late Renaissance balustrade, reminding one rather of some of Mr. Sargent's architectural sketches. His largest work is a very effective picture of the deep embrasure of an old window with the moonlight streaming through it, though we can see no connexion between the picture and the musical composition after which it is named. As a whole, this is an interesting exhibition, and worth a visit.

The collection of water-colours by Mr. Wallace Rimington, in an adjoining room, represents rather the commonplaces of water-colour art, in a pleasant finished style which does not arouse one very much. He treats architecture well, however, and with the exception of the landscape called "On the Rocks" (a sketch of much more power than most of the other landscapes), the architectural subjects are the best things in the room; we may mention especially "An Unknown Town" (15); "The Walls of Rothenburg" (34); "Sta. Maria della Misericordia, Venice" (64); "The Stad-Huis, Middelburg" (73); and "The Bridge at Cividale" (100).

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Christmas recess was held on Tuesday in the County Hall, Spring-gardens, Mr. R. A. Robinson, Chairman, presiding.

Loans.—It was agreed to lend Bermondsey Borough Council 3,886*l.* for electric lighting, and St. Marylebone Borough Council 4,426*l.* for a similar purpose. Sanction was also given to the borrowing by Chelsea Borough Council of 2,562*l.* for paving.

Erection of Cottages on Section B, White Hart-lane Estate.—The Housing Committee reported as follows:—

"Mr. G. E. Pulford, the contractor for the erection of 103 cottages on the second part of section B of the White Hart-lane Estate, Tottenham, has applied for an extension of the time specified in the contract for the completion of the work. The progress made under the contract has been slow, but the contractor has recently made arrangements whereby the execution of the work will be accelerated. To re-let the contract would probably involve additional delay, and, as the portion of the work already carried out by Mr. Pulford is satisfactory, we think it desirable that he should be given a reasonable opportunity of completing the contract. A form of agreement has been prepared providing that the whole of the work shall be finished by October 13, 1909, and we recommend that an agreement be entered into with Mr. G. E. Pulford, the contractor, for the erection of 103 cottages on the second part of section B of the White Hart-lane Estate, providing that the time limit of sixteen months fixed by the principal contract for the completion of the work shall be extended from October 19, 1908, to October 13, 1909."

This was agreed to.

Erection of Cottages, Totterdown-fields Estate.—The Housing of the Working Classes Committee submitted a list of tenders for the erection of 112 cottages on the third part of section C of the Totterdown-fields Estate, Tooting, and they recommended that the tender of Messrs. Rowley Brothers, amounting to 22,130*l.*, for the erection of 112 cottages on the third part of section C of the Totterdown-fields Estate be accepted.

The full list of tenders appears in our Tender columns.

Mr. G. Dew moved the reference back on the ground that the contractors were getting the Norbury bricks at 8s. under the market price. If they looked in the *Builder* for that week they would find the market price of bricks, which would confirm his statement.

Mr. H. R. Taylor seconded.

Mr. G. Billings said that as an illustration of the advantage of municipal trading he could mention that the Norbury bricks cost the Council 42s. 6d. per 1,000, and for picked bricks they were being offered at 16s. 5d.

The Hon. W. Guinness, in reply, said that Mr. Dew was under an entire misapprehension as to the arrangements made in regard to the bricks. The firm of contractors in question, *i.e.*, Messrs. Rowley Brothers, were not under the contract proposing to buy the bricks at all; they were going to supply their own bricks, and the Committee would endeavour to get rid of the Norbury bricks at the best price possible. He was precluded from mentioning the price offered for the bricks, as in the event of none of the tenders for them being accepted it might have prejudice on any other transaction.

The amendment was rejected and the Committee's recommendation adopted.

Theatres.—The proposals based on the following have been agreed to:—

A drawing, submitted by Messrs. F. Matcham & Co., showing a proposal to rearrange the seating in the stalls, and to form a new exit therefrom, at the New Grand Theatre of Varieties, St. John's-hill, Clapham Junction.

A drawing, submitted by Mr. W. G. R. Sprague, showing a proposal to enlarge the heating-chamber at the New Theatre, St. Martin's-lane.

Drawings, submitted by Mr. G. A. Richardson, showing a proposal to alter the stage-door at the Savoy Theatre, Strand.

Drawings, submitted by Mr. F. A. Tugwell, showing proposals to execute certain alterations at the Shaftesbury Theatre, Shaftesbury-avenue.

Work at Long-grove Asylum.—The Asylums Committee reported as follows:—

"*Land Drainage.*—Much difficulty has been experienced at Long-grove Asylum in the cultivation of the farm, on account of the nature of the soil. A system of land drainage seems to have been put in some thirty-three years ago at a depth of 4 ft., but, although this was the depth usual at that time, subsequent experience has proved that it is too great, especially in clay soils. The result at Long-grove is that the clay in the trenches has become so tightly puddled round the pipes that water cannot percolate, and the land is waterlogged. It is therefore necessary to redrain the land at a less depth, and we are advised that the cost of dealing with about 40 acres will probably be 340*l.* Authority has been given for the carrying out of the work, and the cost will be charged to the capital vote of 551,213*l.* for the provision of Long-grove Asylum.

Arbitration: Erection of Stamford Hill Carshed.—On June 23, 1908, we reported the acceptance of a tender of Messrs. J. Wainwright & Co., Ltd., to carry out tar-paving work required at Long-grove Asylum at the rate of 1s. 7d. per square yard, the total cost being estimated approximately at 1,188*l.* Owing to the clayey nature of the soil it has been found necessary to tar-pave paths at the hospital villas, isolation hospital, and other places, the need for which was not contemplated in the first instance. This has involved an extra cost of 178*l.* 5s. 4d., the actual total cost of the work done under Messrs. Wainwright & Co.'s contract being 1,365*l.* 15s. 4d."

Arbitration, Erection of Stamford Hill Carshed.—The Highways Committee reported as follows:—

"The Council on May 26, 1908, decided to enter into an agreement with Messrs. Holliday & Greenwood, Ltd., providing for the reference to arbitration of certain points in dispute with regard to their contract for the erection of the Stamford Hill tramways car-shed. The arbitrator, Mr. William Flockhart, F.R.I.B.A., has now issued his award, by which the Council is required to pay 1,532*l.* 10s. 3d. to the contractors and half the arbitrator's fee of 150*l.* The total sum payable by the Council is therefore 1,607*l.* 10s. 3d., as against the contractors' claim of 6,001*l.* 17s. 8d. . . ."

Having transacted other business, the Council adjourned.

THE ROYAL SANITARY INSTITUTE:

MANCHESTER NEW INFIRMARY.

ON the 22nd inst. a meeting of the Royal Sanitary Institute was held at Manchester, when the members were conducted through the Manchester Royal Infirmary by the architects, Messrs. E. T. Hall and John Brooke. In the evening a discussion on "The Manchester Royal Infirmary from the Hygienic, Sanatory, and Æsthetic Points of View" was similarly conducted in the Manchester School of Technology. The two architects opened the proceedings, which were presided over by Mr. H. D. Searles-Wood, Chairman of the Institute.

Mr. Hall's opening paper consisted of a detailed description of the plan and equipment of the institution. Emphasis was laid on the hygienic, sanatory, and æsthetic features of the new building, Mr. Hall pointing out the excellent provision made for the circulation of fresh air throughout the institution. There was not a single enclosed area in the whole of the hospital, while, judged by the population standard, the infirmary when full would not have more than about seventy persons per acre. On the question of ventilation, the lecturer pointed out that the air in Manchester generally is practically pure, containing about five parts per 10,000 of carbondioxide, as against three parts in the mountain wilds of Scotland. There are four and a third miles of drains within the curtilage of the building, two main drains running into the Oxford-road sewer and one into the York-place sewer. Of the main wards, the speaker said that each was a parallelogram, giving 130 ft. of floor area and about 1,800 cubic ft. to each bed. The ratio of window to floor area was one to four.

Mr. Brooke, in the course of some general remarks, supported the contentions of Mr. Hall, and paid a tribute to the excellent composition of the Management Board of the infirmary.

Professor Radcliffe, in opening the discussion, asked what provision had been made for future extension. This was in Manchester a matter of the greatest importance. Also was there any provision made for the exercise of patients during their period of convalescence? And had any provision been made for the extraction of dust from the air supplied to the wards?

Mr. Puncheon, of Sheffield, asked a few questions, and paid a tribute to the general excellence of the scheme of the buildings.

Mr. W. Thorburn pointed out that many points of detail were determined by the Medical Board before the architects came on the scene. In the matter of circular wards, he worked in the only one in the hospital, and he found that it grew in popularity with the nurses more every day; in fact, it was the most popular ward in the hospital. The speaker also made allusion to the question of the provision for future extensions. That was a question that must be left to a future generation. It was not probable, he said, that the small septic block would ever be used at all. Still, it was a provision against any possible contingencies. If there was one great criticism to be urged against the new institution, it was that already, on 13 acres of land, the hospital buildings were crowded. He asked what would have been the case if the buildings had been kept on the 5 acres of the Piccadilly site. These things apart, he expressed the highest praise for the fabric and the excellent structural details contained therein.

Dr. Niven, as well as other and later speakers, emphasised the excellence of the institution, and paid a tribute to the work of the architects connected with it.

THE BUILDER

JANUARY 30, 1909.

TO CORRESPONDENTS.

J. B. W. (name should have been enclosed. In our opinion your suggestion would completely spoil the balance of the design).

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to "THE PUBLISHER," and *not* to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

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MEETINGS.

FRIDAY, JANUARY 29.

Glasgow Architectural Craftsmen's Society.—Mr. F. A. MacDonald, C.E., on "Reinforced Concrete—its Requirements and its Application." 8 p.m.

Architectural Association Debating Society.—Mr. H. J. Leaning, F.S.I., on "Approximate Estimating." 7.30 p.m.

SATURDAY, JANUARY 30.

The Royal Institution.—Professor Sir H. von Herkomer on "Sight and Seeing." 3 p.m.

MONDAY, FEBRUARY 1.

Royal Institute of British Architects. — President's address to students and presentation of prizes. 8 p.m.

London Institution.—Professor Ernest A. Gardner on "Nature and Convention in Ancient Art," illustrated. 5 p.m.

Royal Academy of Arts (Lectures on Architecture).—Professor R. T. Blomfield, A.R.A., on "Early French Renaissance Architecture.—I.: The Italians in France." 4 p.m.

University of London (South Kensington).—Mr. Banister Fletcher on "Spanish Renaissance," illustrated. 8 p.m.

Polytechnic, Regent-street.—Lecture, with illustrations and practical demonstrations, on "The Technology of Decorative and Protective Paints, with Special Reference to Zinc Paints," by Mr. J. Cruickshank Smith, B.Sc., F.C.S. 8.30 p.m.

Society of Engineers.—(1) The President for the year 1908, Mr. Joseph William Wilson, will present the Premiums awarded for papers read during last year. (2) The President for the year 1909, Mr. Edward John Silcock, will deliver his Inaugural Address. 7.30 p.m.

Royal Society of Arts (Cantor Lecture).—Mr. G. L. Addenbrooke, M.I.E.E., on "The Public Supply of Electric Power in the United Kingdom." (Lecture III.) 8 p.m.

Institute of Sanitary Engineers.—Presidential address by Mr. W. H. Prescott, M.Inst.C.E. 8 p.m.

Liverpool Architectural Society (Incorporated).—(1) A Special General Meeting to elect an Associate Member. (2) Fifth Ordinary Meeting, when a paper will be read by Mr. Mervyn E. Macartney, F.R.I.B.A., on "The Three Churches of St. Paul," illustrated by lantern slides. 6 p.m.

TUESDAY, FEBRUARY 2.

University of London, South Kensington (Lectures on French Painters).—Mr. Percival Gaskell, R.B.A., on "Antoine Watteau." 3 p.m. and 8 p.m.

Royal Institution.—Professor A. A. Macdonell, M.A., on "The Architectural and Sculptural Antiquities of India."—I. 3 p.m.

Institution of Civil Engineers.—Professor Bertram Hopkinson, M.A., B.Sc., on "Heat-Flow and Temperature-Distribution in the Gas-Engine." 8 p.m.

WEDNESDAY, FEBRUARY 3.

Royal Archæological Institute.—(1) "The Library at the Kepier School, Houghton-le-Spring," by Mr. R. W. Ramsey. (2) "The Romano-British Villa at Stroud, near Petersfield, Hants," with lantern illustrations, by Mr. A. Moray Williams, B.A. 4.30 p.m.

Carpenters' Company, London Wall (Free Lectures on Arts Connected with Building).—Mr. E. Guy Dawber on "The Historical Growth of Design." 7.30 p.m.

Northern Architectural Association.—Paper by Mr. H. Barnes. 7.30 p.m.

Edinburgh Architectural Association (Associates' Meeting).—Paper by Mr. J. Kinross, R.S.A. 8 p.m.

Royal Society of Arts.—Mr. Bolton Smart on "The Problem of Unemployment." 8 p.m.

Northern Architectural Association.—Mr. H. Barnes, A.R.I.B.A., on "Architectural Asides." 7.30 p.m.

THURSDAY, FEBRUARY 4.

Civil and Mechanical Engineers' Society.—Professor H. Adams on "The Stability of Arches." 8 p.m.

Royal Academy of Arts (Lectures on Architecture).—Professor R. T. Blomfield, A.R.A., on "Early French Renaissance Architecture.—II.: The Master Builders." 4 p.m.

Leicester and Leicestershire Society of Architects.—Mr. B. J. Fletcher on "Town Planning," with lantern illustrations. 8 p.m.

FRIDAY, FEBRUARY 5.

Architectural Association.—Mr. H. T. Buckland on "Schools." 7.30 p.m.

Birmingham Architectural Association.—Mr. J. A. Gotch on "The Elizabethan House as Illustrated by Contemporary Architectural Drawings."

Institution of Civil Engineers (Students' Meeting).—The Vernon-Harcourt Lectures on "The Design and Construction of Docks," by Sir Whately Eliot, M.Inst.C.E. 8 p.m.

SATURDAY, FEBRUARY 6.

Sanitary Inspectors' Association.—Twenty-sixth annual dinner, the Georgian Hall, New Gaiety Restaurant, Strand. 6 p.m.

Fifty Years Ago.

FROM THE *Builder* OF JANUARY 29, 1859.

JOB AND TASK WORK; OR, HOW THE DOCKYARD JOINERS ARE FLEECED.—Under this title a correspondent of the *Devonport Independent* makes a statement of rather a strange description, which merits the attention of the authorities. He says—The joiners in the dockyard have for some time been working on what is technically called "job and task work," and for several days past have continued to work until six o'clock p.m. On Saturday night last the workmen were in high glee on the supposed good week's wages they had earned, when on being paid, to their utter consternation they were mulcted in 3s. 3d. each man, being simply told by the measurer in a cool official-like manner that they had not done a sufficient quantity of work. This amount at one stroke well-nigh swept off the whole of the overtime, and was but another form of saying, "You must work overtime for nothing." If they earn 2*l.* a week they receive only their 1*l.* 3s.; but if their work should be the least particle short it is immediately checked, even down to a fourpenny-piece. It was only the previous week the same men earned 15s. 6d. more than their wages, but they have not as yet received a fraction of it. Another very just complaint is, that the men have no opportunity of knowing whether they have earned their wages or not, as they do not know the scale of prices paid. The prices are carefully preserved in official obscurity.

BOOKS RECEIVED.

THE ACROPOLIS OF ATHENS. By Martin L. D'Ooge. (Macmillan & Co. 17s.)

DER BURGWART: ZEITSCHRIFT FÜR BURGENKUNDE UND MITTELALTERLICHE BAUKUNST. IX Jahrgang. (Berlin; Franz Ebhardt & Co.)

JAPANESE PATENTS. By H. S. Bickerton Brindley, A.M.Inst.C.E. (The British Press. 5s.)

LAXTON'S BUILDERS' PRICE BOOK: 1909. (Kelly's Directories Company. 4s.)

OLD LONDON: FIFTY REPRODUCTIONS OF OLD ENGRAVINGS. Compiled by Walter L. McNay. (The De La More Press. 3s. 6d.)

THE PRACTICAL ARTS OF GRAINING AND MARBLING. By J. Petrie. (Trade Papers Publishing Company, Ltd. 50s.)

SPON'S ARCHITECTS' AND BUILDERS' POCKET PRICE BOOK: 1909. Edited by Clyde Young, A.R.I.B.A. (E. & F. N. Spon.)

PUBLIC LIBRARY, HENLEY-IN-ARDEN.—A hall suitable for large public gatherings has been opened at Henley-in-Arden. The building comprises concert-hall, with gallery, a stage, a reading-room, billiard-room, cloakrooms, and a miniature rifle range. The large hall will seat about 400 persons. The structure has been built from the designs of Messrs. Osborn, Pemberton, & White, Birmingham, by Messrs. C. G. Huins & Sons, Redditch.

Illustrations.

DETAIL ELEVATION OF DESIGN FOR LONDON COUNTY HALL.

THIS fine drawing is the detail elevation of the design submitted by Mr. Robert Atkinson in the second competition for the London County Hall. Mr. Atkinson writes:—

"The building has been designed in a free rendering of the Renaissance with a French influence, which the author considers eminently suitable for this important building.

Externally, the object has been to obtain a broad, dignified, and grand effect by massing of the principal parts, and the whole surmounted by a great tower nearly 100 ft. square, and rising 260 ft. above water-line.

The principal entrance is situated in Belvedere-road, with carriageway approach through a fine architectural screen and *porte-cochère* into the large entrance-hall.

The elevation shows the detail in connexion with this entrance."

The drawing was exhibited at the last Royal Academy Exhibition.

ST. JOHN'S SCHOOLS, NEW NORTH-ROAD, HOXTON, N.

THESE schools were formerly a two-storied building in the Gothic manner, the heads of the first-floor windows being at the level of the jamb stone next below the top, and the windows were filled with casements formed of very small squares. The first floor was divided into two large rooms and the two small south rooms, all enclosed by brick walls.

The present alterations, for the Rev. Eric Farrar, were planned to meet the requirements of the Education Act, and consisted of thorough repairs throughout; taking down the parapets to the level of the first-floor window heads and forming a new second floor for use as a boys' school, which is entirely self-contained, as there is no playground attached, the adjoining churchyard being used for that purpose.

The first floor has been divided into class-rooms on the same lines as the second floor for use as a girls' school, and the ground floor will be used as an infants' school and for parish purposes.

The elevations have been cleaned down, and the new story carried out in similar materials, viz., London stocks with Suffolk bricks and Bath stone dressings.

New window-sashes in large squares have been provided throughout, and a low-pressure hot-water heating system installed.

The general contractor was Mr. P. Kerridge, of Buckland-street, N., and the architects Messrs. Lovegrove & Papworth.

THE ANSDELL INSTITUTE, ANSDELL, LANCASHIRE.

THE design for this building was selected in competition.

The plan provides for two complete sections viz., a Public Hall and an Institute. The Hall, 75 ft. by 34 ft., has seating accommodation for 400 people, cloakrooms, etc., for both sexes at the entrance, and a large platform with artistes' retiring-rooms at the other end.

A large chair-store has been planned beneath the raised platform for use when required.

The Institute section contains, on the principal floor, a reading-room, library, small billiard-room, refreshment and committee rooms, with suitable lavatory accommodation, together with cardroom and a large billiard-room on the first floor.

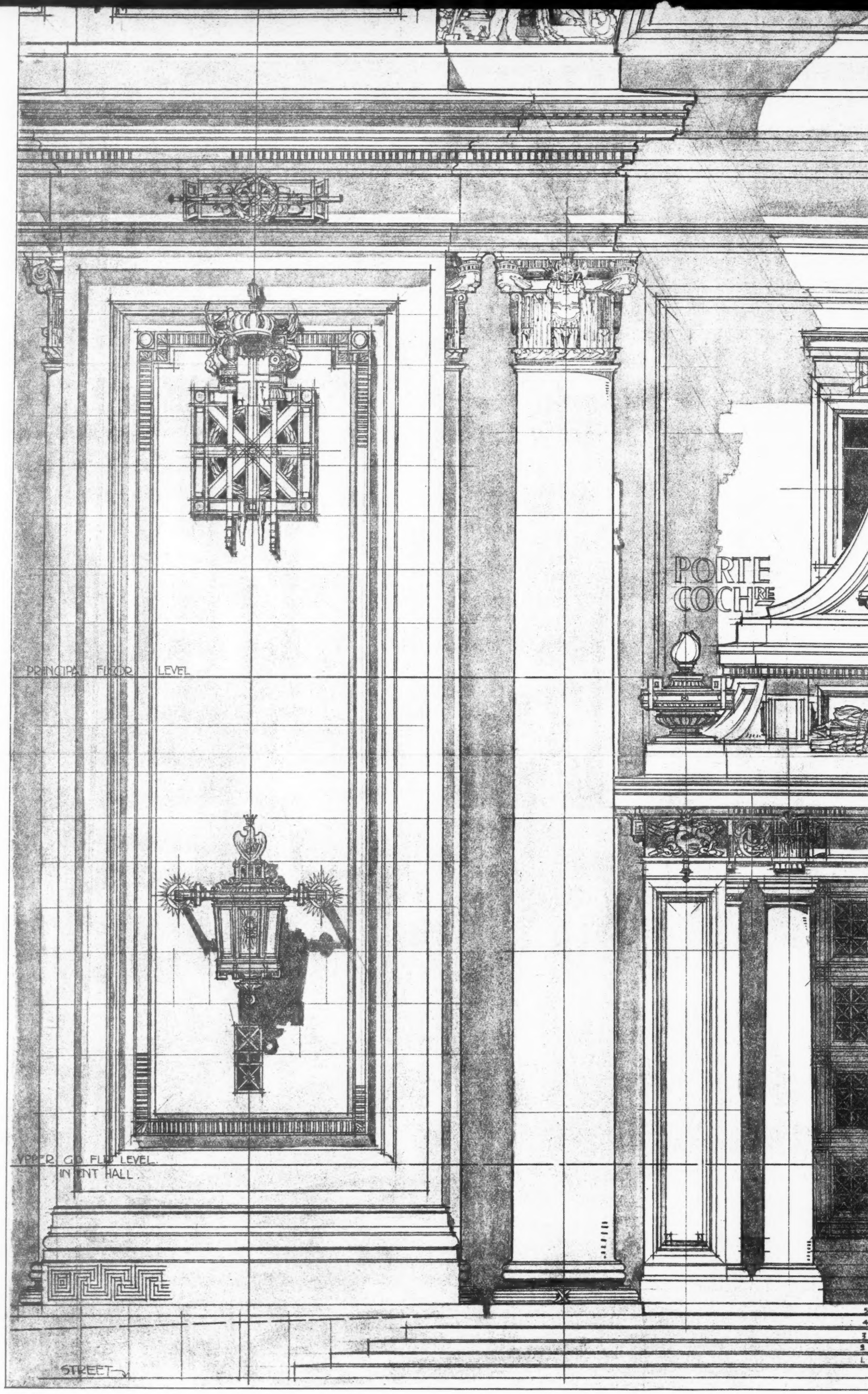
The various rooms throughout will be heated by hot water on the low-pressure system, divided into sections to correspond with the several divisions of the building.

The building is faced with plastic "Nori" Accrington bricks, and the floor of the Public Hall will be of polished oak on a spring

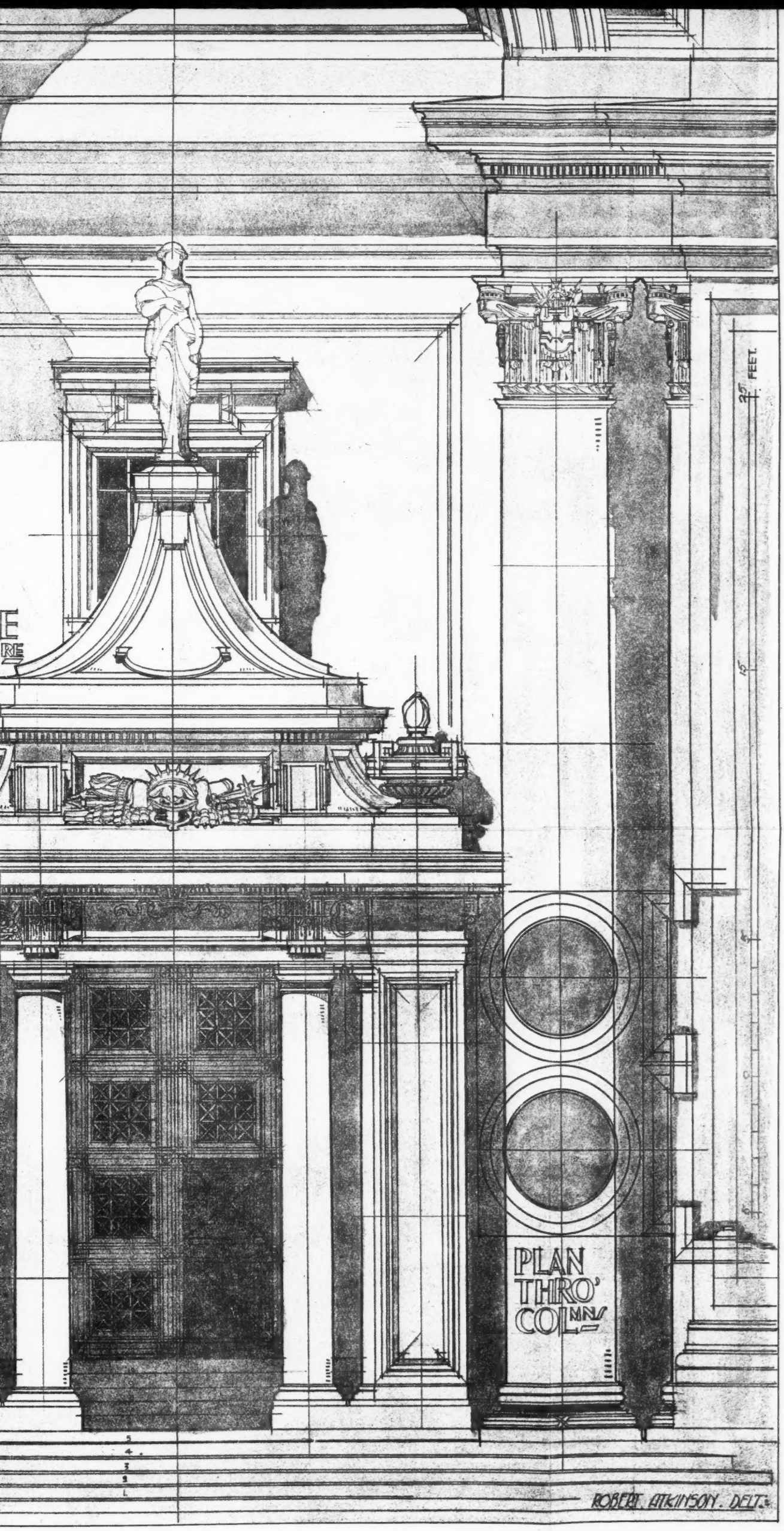
L.C.C. NEW

NEW COVNTY HALL.

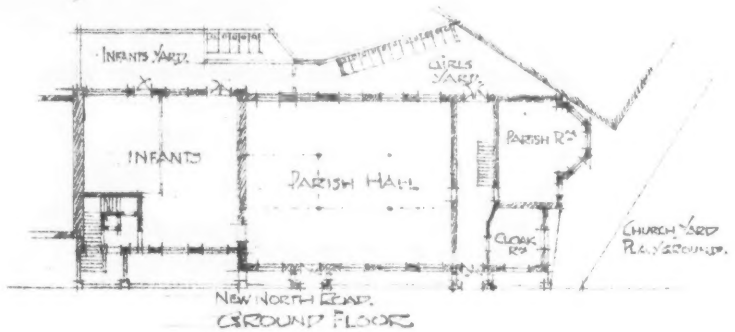
DETAIL OF MEMBERS ENT IN BELVEDERE ROAD.



DETAIL ELEVATION OF COMPETITION DESIGN FOR LONDON COUNTY



NDON COUNTY HALL.—By Mr. Robert Atkinson, F.R.I.B.A.

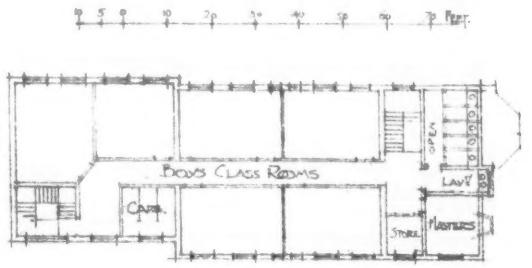


GROUND FLOOR

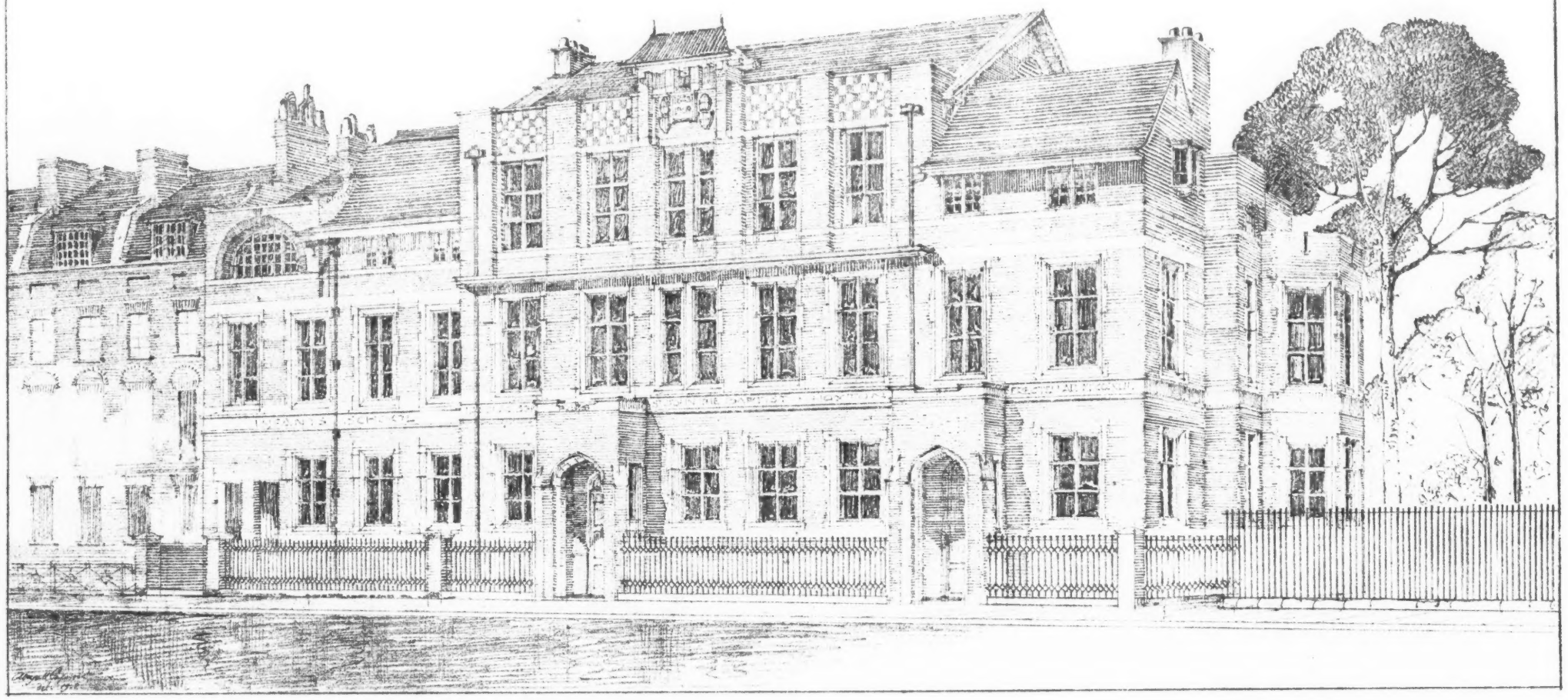
ST JOHN'S SCHOOLS HOXTON

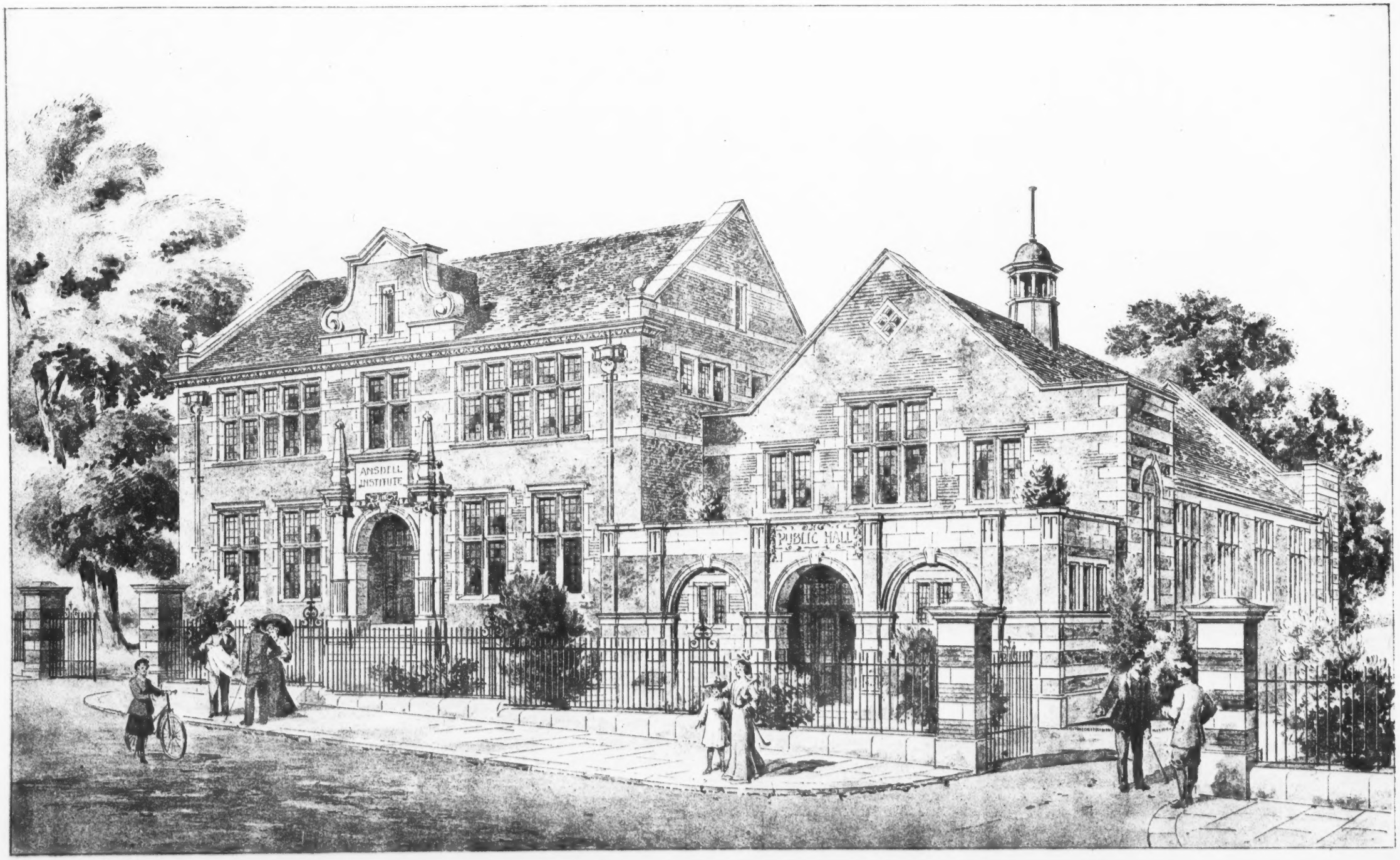
ALTERATIONS & ADDITIONS TO EXISTING BUILDINGS

LOVEGROVE & FARWORTH ARCHTS



NEW SECOND FLOOR

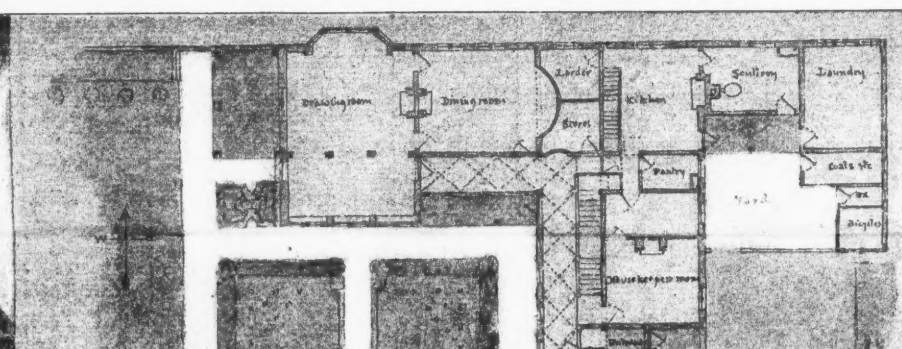


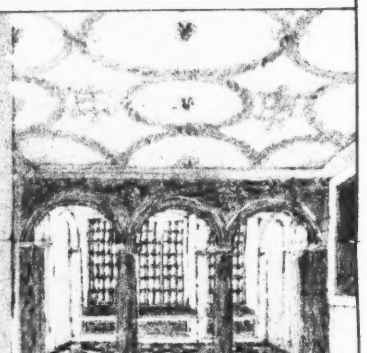


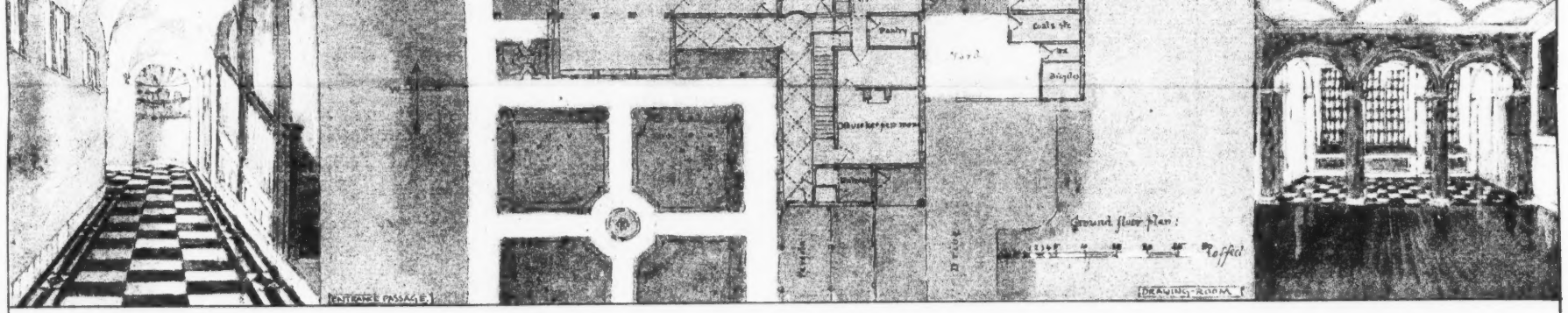
THE ANSDELL INSTITUTE, ANSDELL, LANCASHIRE.—Mr. C. H. W[illegible]

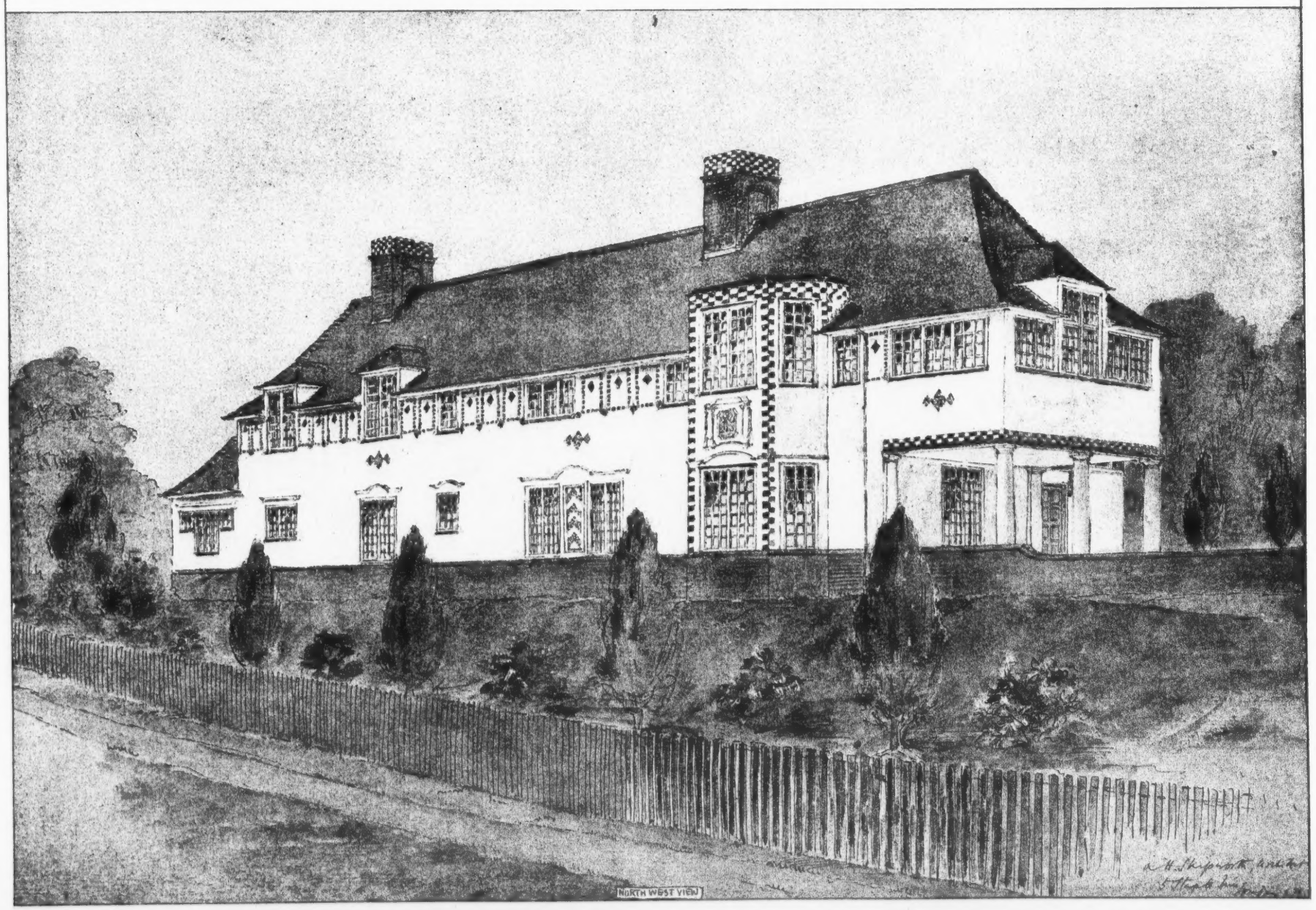
HOUSE FOR SHORNE ROCHESTER

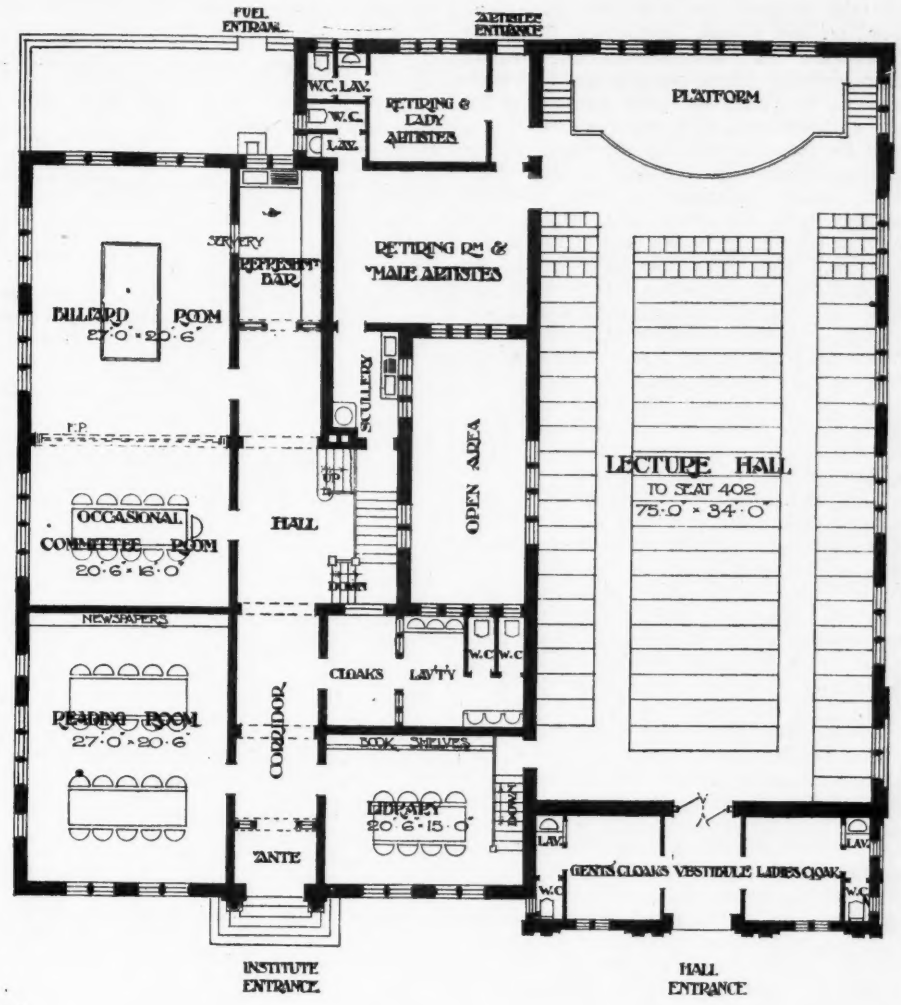
SOUTH WEST VIEW



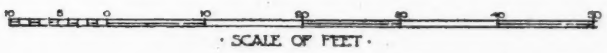



[ENTRANCE PASSAGE]
Pantry
Coals &c
Ground floor Plan :
[DRAWING-ROOM]


NORTH WEST VIEW



GROUND FLOOR PLAN



The Ansdell Institute.

construction supplied by Messrs. Goodall & Co., of Manchester.

The general contractors are Messrs. Dryland & Preston, of Blackpool and Littleborough; and the terra-cotta modelling is by Mr. J. J. Millson, of Manchester. The estimated cost is about 4,500*l*.

Mr. G. H. Willoughby, of Manchester, is the architect.

HOUSE AT SHORNE, NEAR ROCHESTER.

THIS very charming and picturesque design for a house is by the late A. H. Skipworth, whose early death we had to regret some little time since.

We can of course give no special information about it; we can merely give it as an example of his work. We should conclude that it was a brick house roughcast, and that the quoins at the angle of the bay, and the chequer-work over the verandah, are red-brick showing against the roughcast.

THE CARPENTERS' HALL LECTURES:

REASON IN BUILDING.

THE second of the series of thirteen free lectures on "Arts Connected with Building," arranged by the Carpenters' Company, was delivered on Wednesday last week in Carpenters' Hall, London Wall, the lecturer again being Mr. R. Weir Schultz, whose subject was "Reason in Building, or the Common-sense Use of Materials."

The chair was occupied by Mr. Niemann Smith, past-Master, who said he felt great sympathy for architects, because of those who practised in the arts no men were more ill-treated, as was shown by the way in which good buildings were often disfigured by advertisements. One thing which struck him last week, in looking at the lantern-slides shown by the lecturer, was the way the chimneys were treated in the buildings, and were made an architectural feature. Why was that not always the case? Chimneys were a very common part of a building and they were generally a failure. In Mr. Norman Shaw's New Scotland Yard the chimneys were a dignified feature, but a few yards away, in Whitehall-court, were some buildings with a beautiful skyline disfigured by a hideous fringe of chimneypots.

Mr. Schultz said he intended to consider the principal crafts connected with building, and to try and help them to discriminate generally how far it was possible to deal with the materials suitable to those crafts in an honest, simple, effective and straightforward manner. In much of the work carried out nowadays, he regretted to say that materials were used in an entirely unsuitable manner, to the great detriment of the structure both as a work of art and as a reasonable piece of construction. As Professor Lethaby had remarked, "Art is man's thought expressed in his handwork," and the large amount of bad art and false construction with which we were surrounded was largely due to the want of right training—often due to the entire absence of real training. We found half-trained men striving after effects which they did not understand, or attempting the impossible. There was a general note of inefficiency about a great deal of the work of the time, though he quite realised that much fine work had been done recently, and was being done at the present time; but such work was more or less exotic and was being done by a comparatively small number of people—was more or less individual and did not represent the general average of thought and execution. A good deal of this, he was sorry to say, was due to the false position of architects at the present day, and to the wrong lines on which they had been trained. He did not wish to give the impression that architects were not cognisant of this; many were, and earnest endeavours were being made to grapple with the evil. But how was it possible to get satisfactory results as long as young architects were trained mainly in front of drawing-boards in stuffy offices, or even in colleges—not in touch with actual work, except for occasional visits to works in progress? All this was excellent in its way, but it was not sufficient to give a young man the right feeling for materials or construction, for this could only be absorbed gradually in contact with practical work. It was not surprising that some of the best architects of the past had been those who had passed through the workshop, afterwards bringing real practical knowledge to the task of dealing with problems of construction. He had in his mind Bentley, the architect of Westminster Cathedral, who received a thorough practical training and whose work showed his training; there was a quality in that work which was not to be found in the work of those who did not understand materials, or the right methods of construction. The average young architect of to-day passed from school or college to the office of, say, an architect in good professional practice, where for three or four years he picked up what knowledge he could from designs on paper. Occasionally he was taken or allowed to go on a visit to a building in progress. If at all keen, he kept his eyes open and asked the builder or the clerk of works questions; but how seldom did he stop and follow the course of the work, and see things day by day, and in the actual doing? And how far less seldom, did he take off his coat and try to do something himself if only to find out how difficult it was to do? Yet that was the youth who, at the end of three or four years, if he had friends and influence, sat down and designed buildings and instructed practical men to do their work—often in an autocratic way, for after all isn't the architect looked upon as the 'boss' and doesn't the contract say that he is to be obeyed and his directions followed implicitly in every respect?

Fancy, if Master Henry of Westminster, King's Master Mason in the XIIIth century, or Master Alexander, King's Carpenter, had been supplied with full-size details prepared by an office-trained theorist to show them how to do their work. These men were thoroughly trained craftsmen, who started from the beginning and worked up and by sheer ability took high rank in the land. If anyone wanted to know how our famous historical buildings were erected, and what manner of men they were who erected them, they should read that delightful book by Professor Lethaby, "Westminster Abbey and the King's Craftsmen: a Study of Mediæval Building." Then they would not be surprised that buildings in these so-called peaceful and prosperous and civilised days should fall so far short of what they were in the ages when the bulk of the men of England were supposed—and erroneously supposed, he thought—to be in a state of vassalage and serfdom.

He did not wish to say that an architect must not have any theoretical training; there was, in fact, much that he could learn more quickly and better in schools and colleges—such as constructive science. They were told that an architect need have only a rudimentary training in science, but surely that was a mistake! The architect of the future would have to be, to a considerable extent, an engineer. He

would have to deal—he had already to deal—with new scientific methods of construction, which involved a considerable amount of mathematical knowledge, exact calculation, and technical skill if great waste of materials and extravagance in cost were not to result. If a real, living architecture was to come it must come from the skilful, reasonable, and sound use of materials, properly thought out and put together on a clear scientific basis—the so-called artistic part would take care of itself. All good art was unconscious, and much of the trouble to-day was self-consciousness. A man did not want to be an artist with a capital A, in order to erect a beautiful building; but he did want to be a constructor. If they got their knowledge right, their art would come. Often the back of a building was the most interesting part of it, largely because it was the natural and unconscious outcome of the real conditions of the problem. Edinburgh new town was built in the XVIIIth century, when the classical influence was permanent, and when no doubt the architects were men who designed on paper; and they designed the fronts of their buildings very much as the houses of Gower-street, London, were designed. From the Castle of Edinburgh the backs of the buildings of the new town could be seen, and the effect of the gables and chimneys was magnificent. The front of the buildings had been done to the drawings, and the backs were left to the old traditions, and that made all the difference. With a sound scientific basis in our modern education we could hope to establish a real modern building tradtion. In such matters as scientific construction our modern architects were, he was afraid, with very few exceptions, in the hands either of people who called themselves constructive engineers, or of commercial firms.

The lecturer then considered in some detail the various works which go to make up a building, and gave some useful hints to students in regard to foundations—clay, concrete, mortar, stone, sand, scaffolding, etc. Speaking of the by-laws again, he said that a friend of his, a capable architect, had to put up a house in the Dorking Rural District, where, according to the by-laws, concrete had to be put under all foundations. On the site in question there was rock close to the surface, and his friend proposed to build on the rock, but the surveyor insisted on concrete being put in, and the rock had to be cut out, in order to put in a foot of concrete. As to the composition of concrete, in some districts the best materials could be got, and in others the material was of an indifferent character. Very often the best advice as to such matters could be obtained from the ordinary labourer employed on the foundation if he had been accustomed to work in the district and with the local materials; and it was a good practice to talk to these men. The theorist was often wrong and the local man right on these points.

As to scaffolding, the craft was a fine art, but he was afraid it was deteriorating. Nowadays we got high-art scaffolding, painted with nice decorations, and under some circumstances scaffolding was becoming a costly affair. It had to be done by a trained engineer and passed by the London County Council. The great Stadium at the Franco-British Exhibition was a fine piece of work, which had to be erected in the strongest way and at the least cost, and it was to be hoped that the work would not be destroyed.

Stone should be known before it was used, and they should go to the quarry and see how it is quarried. And if used in the district where it was quarried, it was well to look at the buildings erected with it to see how it weathered. If they found that the mouldings had deteriorated, then they should decide not to have mouldings in that stone, or they should protect the mouldings if they used the material. They should use the stone to suit the design. Most stones had a definite bed, and if they were not laid properly on that bed the stone flaked off and rotted. Generally, the effect of weather on stone should be studied. Some beautiful effects could be got with such stone as Portland, as could be seen at St. Paul's Cathedral. As to windows, the effect could be varied greatly by the depth of the window-frames from the face of the stonework. Many buildings of the XVIIIth century, both in brick and stone, were brought out nearly to the face of the stonework, and the effect was very good. In buildings of a monumental nature the woodwork was recessed back, and the building was treated as a stone composition. Buildings of that kind which had struck him were the group of later city churches built by Hawksmoor. As to tooling the surface of materials, in the North certain tools were used and a beautiful texture was obtained. The modern system of dressing stone was by scraping and dragging, and the surface effect was not good. He preferred sawn surfaces to dragged surfaces. He thought that stone slates would again be preferred to the horrid Welsh slates, which were much cheaper, however. There was great danger in studying stonework or brickwork of harking back to the old buildings and simply copying them. There was such a thing as unintelligent archæology—the copying of old forms without regard to suitability. Old forms should be studied intelligently, so as to see what the old men were striving for. Inspiration could be got from old work, but they must strive to get behind the surface, and they should not copy. As to granite, it should be used in a simple, straightforward way, as it did not lend itself to mouldings or carvings, and for basement work it ought to be used simply. Marble should be used so as to get a judicious and harmonious arrangement of colours. We did not want marble in London when we had our beautiful Portland stone.

The lecturer then showed a large number of excellent lantern-slides of buildings, in order to illustrate his remarks; and on the motion of the Chairman a vote of thanks was accorded to him, and the proceedings terminated.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Bermondsey.—A building on the western side of Tower Bridge-road, Bermondsey, to abut also upon the southern side of Tanner-street (Messrs. Western & Sons for the City of London Brewery Company, Ltd.).—Consent.

Hackney, Central.—That the application of Messrs. Rowlandson & Co. for an extension of the period within which the erection of projecting shops in front of Nos. 214 and 216, Mare-street, Hackney, was required to be completed, be granted.—Consent.

Hackney, North.—A conservatory at No. 93, Amhurst-park, Stoke Newington, to abut upon Bethune-road (Mr. J. Savage for Mr. T. H. Dey).—Consent.

Hackney, North.—A glass covered way between an existing factory and a proposed extension to such factory on the western side of Kersley-road, Stoke Newington (Mr. A. W. Hudson for Mr. H. Mitchell).—Consent.

Hammersmith.—Wooden bay windows and hoods to fifteen houses on the western side and thirteen houses on the eastern side of Emlyn-road, six houses on the southern side and seven houses on the northern side of Palgrave-road, eight houses on the western side and two houses on the eastern side of Hartswood-road, Hammersmith (Mr. W. G. Chapman).—Consent.

Hampstead.—The retention of a shop front erected under the projecting landing at No. 150, Finchley-road, Hampstead (Messrs. C. Saunders & Son).—Consent.

Hampstead.—Alterations and additions at No. 577, Finchley-road, Hampstead (Mr. W. W. Bull for Dr. Mabel Hardie).—Consent.

Holborn.—The retention of a projecting sign at No. 26, Gray's Inn-road, Holborn (Messrs. Caspar & Co.).—Consent.

Islington, South.—A one-story building on the western side of Upper-street, Islington, northward of John's-place (Mr. M. S. Ward).—Consent.

Kensington, South.—Retention of a sign at No. 4, Bute-street, Kensington (Mr. H. Bignold for Messrs. J. O. Wood & Co.).—Consent.

Lambeth, North.—An illuminated sign at No. 156, Westminster Bridge-road, Lambeth (Brilliant Sign Company, Ltd.).—Consent.

Lewisham.—Porches to nineteen houses on the western side of Muirkirk-road, Catford (Mr. T. A. Boughton).—Consent.

Marylebone, West.†—Two iron and glass signs in front of No. 460, Oxford-street, St. Marylebone (Stanley Jones and Co., Ltd., for Messrs. S. F. Goss & Co.).—Consent.

Marylebone, West.—A porch in front of No. 57, Carlton-hill, St. John's Wood (Messrs. New & Son for Mr. G. J. Beer).—Consent.

St. George, Hanover-square.—A stone porch at No. 26, Upper Brook-street, St. George, Hanover-square (Mr. Arnold Mitchell for Mr. J. Munro Coates).—Consent.

Strand.—Oriel windows and balconies on the Piccadilly frontage of a building to be erected upon the site of Nos. 174, 175, and 176, Piccadilly, and Nos. 52 and 53, Jermyn-street, Strand (Mr. G. T. Jell for Mr. Emile Danziger).—Consent.

Wandsworth.—Shops at Nos. 45 and 46, Rostella-road, Wandsworth, to abut also upon the north-eastern side of Thurso-street (Mr. F. G. B. Crawley for Mr. W. Newman).—Consent.

Marylebone, East.—The re-erection of No. 139, Park-road, St. John's Wood (Mr. E. Faux for Courage and Co., Ltd.).—Refused.

Marylebone, West.—Cornices over the shop fronts at Nos. 32, 34, 36, 38, 40, 42, and 44, Edgware-road, and Nos. 66 and 68, Seymour-street, St. Marylebone (Mr. F. W. Hunt for G. Cozens & Co., Ltd.).—Refused.

St. George, Hanover-square.—The retention of a projecting sign at the Windsor Castle public-house, Vauxhall Bridge-road, St. George, Hanover-square (the Brilliant Sign Company, Ltd.).—Refused.

Strand.—The retention of two projecting box signs in front of the Criterion Restaurant, Piccadilly-circus (Mr. F. Legg for Spiers & Pond, Ltd.).—Refused.

Wandsworth.—Additions at the Primrose Laundry, Bendon Valley, Wandsworth (Mr. B. C. Apps).—Refused.

Width of Way.

Battersea.—Retention of a brick furnace and chimney-shaft on the south-western side of Phœnix Wharf-lane, Church-road, Battersea, at less than the prescribed distance from the centre of the roadway of Phœnix Wharf-lane (Messrs. J. A. J. Woodward & Sons for Messrs. May & Baker).—Consent.

City of London.—An external iron staircase at the rear of Nos. 48 and 49, Old Bailey, City, at less than the prescribed distance from the centre of Fleet-lane (Messrs. P. & H. W. Curry).—Consent.

Paddington, South.—Retention of a petrol store at the southern end of Polygon-mews, Paddington (Messrs. Elliott, Tombs, & Co. for Messrs. A. & N. Mori).—Consent.

Southwark, West.—Houses to be inhabited by persons of the working class on the sites of Nos. 17 and 19, Crosby-row, Southwark, at less than 20 ft. from the centres of Plantain-place and Dove-place, and exceeding in height the width of those streets (Mr. J. J. Freeland for Mr. T. B. Benton).—Consent.

Southwark, West.—A building on the south-western side of Dantzic-street, Southwark, abutting also upon St. George's-market and the roadway leading out of the north-western side of St. George's-market (Mr. W. F. Hurndall).—Consent.

Lambeth, North.—Buildings on the northern and southern sides of Ferry-street, Lambeth, at less than the prescribed distance from the centre of the roadway of such street (Messrs. Buckland & Garrard for Doulton & Co., Ltd.).—Refused.

Width of Way and Frontage.

Lewisham.—A wooden gantry upon a site abutting on the northern side of Catford-road, Lewisham, westward of Thomas-lane (Mr. F. G. Chant).—Consent.

Norwood.†—A building upon the site of Nos. 96, 100, 102, and 104, Shakespeare-road, Brixton (Messrs. Gardiner & Theobald for Osborne & Young).—Refused.

Norwood.—The retention of two greenhouses on the northern side of Water-lane, Norwood, abutting also upon the western side of Effra-road (Mr. G. Beard).—Consent.

Width of Way, Frontage, and Construction.

Hampstead.—A wood and iron building in the grounds of the Freemasons' Arms public-house, on the north-western side of the Downshire-hill, Hampstead, to abut also upon the southern side of Willow-road (Humphreys, Ltd., for Mr. W. Hill).—Refused.

Width of Way and Construction.

Paddington, South.—The retention of a wood and iron addition to a garage at the rear of No. 15, Sovereign-mews, Paddington, at less than the prescribed distance from the centre of the roadway of Polygon-mews (Messrs. Elliott, Tombs, & Co. for Messrs. A. & N. Mori).—Consent.

Lines of Frontage and Construction.

Hampstead.—Retention of a motor-car shed on the forecourt of No. 112, Finchley-road, Hampstead (Mr. H. Harris).—Consent.

Hampstead.—The retention of a motor-car shed at the rear of No. 156, Haverstock-hill, Hampstead, abutting upon Lawn-road (Dr. H. Saunders).—Consent.

Lewisham.—Retention of a showcase of a temporary character in front of No. 27, Lady-well-road, Lewisham (Mr. A. J. Roddis for Mr. H. Mills).—Consent.

Wandsworth.—A deviation from the plan approved for the erection of a wood and brick gantry of a temporary character on the eastern side of Garratt-lane, Wandsworth, so far as relates to an alteration in the position and construction of the gantry (Mr. J. E. Yerbury for Mr. T. Edwards).—Consent.

Line of Frontage and Space at Rear.

Poplar.—A deviation from the plan approved for the erection of two houses on the southern side of Mellish-street, Glengall-road, Poplar, and a building on the northern side of Glengall-road, to abut upon the western side of Mellish-street, so far as relates to the conversion of the building on the northern side of Glengall-road into two separate buildings (Messrs. J. & W. Clarkson for Mr. A. E. Ricks).—Consent.

Width of Way and Space at Rear.

Marylebone, West.—An addition to Stratford House, Stratford-place, St. Marylebone, at less than the prescribed distance from the centre of the roadway of Marylebone-lane (Messrs. W. H. Romaine Walker & Besant for the Right Hon. the Earl of Derby, K.G.).—Consent.

Space at Rear and Alteration of Building.

Westminster.—A deviation from the plan approved for the erection of an addition on the space at the rear of No. 86, Vincent-square, Westminster, and to the omission of the piers under the bressummer at the second floor level, so far as relates to an increase of 6 in. in the height of a portion of the addition to afford better headroom on the staircase landing.—Consent.

Deviation from Certified Plans.

Marylebone, West.—Deviations from the plan certified so far as relates to the proposed erection of a building upon the site of No. 37, Duke-street, and Nos. 13 and 14, Barrett-street, St. Marylebone (Mr. E. H. Dance for Messrs. Krohne & Sesemann).—Consent.

Formation of Streets.

Woolwich.—Formation or laying out of new streets for carriage traffic on the north-eastern portion of the Eltham Park Estate, Eltham, in substitution for certain of the streets previously sanctioned, and deviations in the levels of Glenesk-road, Elibank-road, Earlshall-road, Greenvale-road, and Dunvegan-road (Mr. R. Stewart for Mr. A. Cameron Corbett, M.P.).—Consent.

Hackney, North.—That an order be issued to Mr. C. Thompson, refusing to sanction the formation or laying out of a new street for carriage traffic, to lead out of the north-western side of Big-hill, Hackney.—Refused.

Alteration of Buildings.

City of London.—Omission of iron doors from the outside of the belt run openings in the party wall next the central area at a building on the eastern side of Temple-avenue, City, abutting also upon the southern side of Tudor-street (Mr. H. M. Wakley).—Consent.

Kennington.—The use of armoured doors at No. 124, Cromwell-road, Kensington, be pugged with 5 in. of concrete (Mr. F. E. Williams for Mr. C. Gasquet), in lieu of such floor being constructed as specified in sect. 71 of the Act.—Consent.

Uniting of Buildings.

City of London.—The uniting of Nos. 44, 45, and 45A, Jewin-street, City (Perry Brothers, Ltd.).—Consent.

Kennington.—The use of armoured doors at the premises of the Nugget Polish Company, Ltd., Vauxhall-street, Kennington (Mather & Platt, Ltd., for the Nugget Polish Company, Ltd.).—Consent.

Marylebone, East.—The uniting of Nos. 38 and 40, Langham-street, St. Marylebone, on the basement, ground, and second floors (Mr. F. W. Foster for Messrs. Mackintosh).—Consent.

St. Pancras, South.—The formation of window openings in the party wall between No. 295, Euston-road and 74, Warren-street, St. Pancras, and the exit way to the Warren-street station of the Charing Cross, Euston, and Hampstead Railway (Mr. D. Joseph for Mr. C. L. Lamare).—Consent.

The recommendations marked † are contrary to the views of the local authorities concerned.

Legal Column.

The London Building Act.

An important decision under the London Building Act, 1894, has been delivered by a Divisional Court in the case of Moran & Son *v.* Marsland. The appellants were contractors who were erecting certain reservoirs for the Metropolitan Water Board. The two reservoirs have a floor covered with concrete, and walls constructed of brick-work backed by concrete and earth, and are covered in by brick arches supported on brick piers 20 ft. high. In some portions they project above the ground, and their cubical extent is 2,900,000 and 2,769,000 cubic ft. respectively. The respondent was the District Surveyor for the district of Camberwell, where the reservoirs are situated, and the claim was in respect of 297*l.* 13s., his fees, under sect. 154 of the Act, for surveying the construction of these reservoirs. Before the works were commenced a building notice under sect. 45 had been given to him. It was suggested that this notice had been given by an unauthorised clerk, but the Court held any point as to this was not open to the appellants, and it was also not in question that the District Surveyor had, in fact, surveyed the works during the two years in which they had been in course of construction. The points for the consideration of the Court may be summarised as follows:—(1) That the reservoirs were not "buildings or structures" requiring supervision within the meaning of sect. 138 of the Act and the exemptions therein contained. (2) That the reservoirs, being constructed under the provisions of special Acts of Parliament with provisions inconsistent with the terms of the London Building Act, were not within the latter Act. (3) Subsidiary to these points, it was contended that these reservoirs were "warehouses," and as they exceeded the limits of cubical extent prescribed by sect. 75 and 76, therefore they were not within the Act.

As regards the first point, the Court held the reservoirs to be "buildings or structures" within the Act, following the cases Whitechapel Board of Works *v.* Crow, Charing Cross Electric Corporation *v.* Woodthorpe, and County of London Electric Supply Company *v.* Perkins, which will be found commented upon in our "Notes," February 22, 1908. The present case seems even stronger than the above, since, as the Lord Chief Justice pointed out, in those cases there was another statutory authority having control over the construction, whereas in the present case there was no such authority.

The second point was that which the Court considered the most difficult—whether the statutory powers conferred by the private Act were inconsistent with the London Building Act and excluded it. The private Act and the deposited plans defined what works were to be executed, but did not deal with the material to be used and the method of construction; and the Court held that the provisions of the London Building Act applied, but gave leave to appeal.

As regards the subsidiary point, the Court held these reservoirs not to be warehouses.

The decision of the Court of Appeal will be awaited with interest. Undertakings carried on under statutory powers are increasing, and questions such as the above are consequently multiplying. It seems to make some difference whether the private Act conferring compulsory powers precedes or follows the general Act, but this distinction cannot be supported on principle. What is required, as also in the case of compulsory acquisition of land, is that the general Acts shall be understood to be of universal application unless, on good ground shown, they are expressly varied in subsequent private Acts dealing with particular schemes.

Workmen's Compensation.

A decision delivered by Judge Shortt, in the Dover County Court, under the Workmen's Compensation Act, is of importance to contractors. The application was by the widow of a deceased man who was killed in Malta whilst working in the course of his employment for English contractors. The judge held that the deceased being an Englishman working under contract with an English company, was within the Act and entitled to compensation, as was, therefore, his widow; and the judge also expressed the opinion that a chauffeur or valet travelling abroad on the master's business would also clearly be within the Act.

There seems no reason to doubt that this is a correct interpretation of the Act, although more difficult considerations may arise when the employee is a foreigner employed abroad by an English firm, or the employer is a foreign firm with a place of business in this country, and the contract is entered into here with a domiciled British subject for work abroad. In view of the many conundrums provided by modern legislation, there is no immediate fear of the lawyers joining the unemployed.

Employer and Employed.

The case of Coldwick *v.* Partridge, Jones, & Co., Ltd., referred to in our "Notes" of June 6 last, has been carried to the Court of Appeal, and is one of importance to employers. The facts were fully set out in our former Note, but as far as the decision in the Court of Appeal is concerned, it may be stated that the action was one under Lord Campbell's Act, for damages for the death of a collier who had been killed whilst being conveyed in a train belonging to the colliery company by which he had the option of returning from work. The man, being in a hurry, had got into an overfilled carriage and sat on the floor with his legs outside the carriage, and in passing under a bridge that was being repaired by the company he was struck by the scaffolding, and the jury found his death to have been caused by the negligence of the engineer and the mason who were carrying out this work, and who were both servants of the company. The question for the Court of Appeal was whether these men were in "common employment" with the collier, as, if so, the common law doctrine would apply to absolve the common employer from liability, since every workman is at common law deemed to have taken the risk of his fellow-servant's negligence, provided that the employer has taken proper precautions in procuring competent men. This is an implied contract. The Court held that there was such an implied contract in the circumstances of this case, that the engineer and mason were fellow-servants of the collier, and that the implied contract was not limited to the time when the man was actually engaged in his employment, but that it extended so long as the man was using the means of access or egress from his work supplied by the employers, since the workman must be assumed to have known of these means being supplied, and he elected to use them. As the doctrine of "common employment" is based on contract, it is obvious that for the defence to succeed the negligence, the cause of action, must be that of a servant whose vigilance the fellow-servant could reasonably be expected to rely on, and the risk of whose negligence he can be assumed to have accepted. The mere fact that two men have a common employer will not suffice if in the ordinary and natural course of events the workmen are not dependent one upon the other. Thus, although an engine-driver is in common employment with a carpenter employed by a railway company to repair a turntable or other work connected with the railway system, it has been held that the crews of two ships navigating the high seas or such a river as

the Thames are not in common employment. Common sense will generally interpret the common law correctly, but it is otherwise with statute law, and especially modern statute law. Common sense is rather a hindrance than an assistance, for instance, in interpreting such statutes as the Workmen's Compensation Act.

COMPULSORY ACQUISITION OF LAND FOR SPECIAL PURPOSES.

The case of Lucas and Chesterfield Gas and Water Board, which, when decided in the Court below, was noted in these columns (the *Builder*, January 11, 1908), has been carried to the Court of Appeal, where the decision has been slightly varied. The case is of considerable importance as to the principles which are to apply in assessing compensation under the Lands Clauses Consolidation Act, 1845, where land has special adaptability for some special purpose. The land in question possessed peculiar natural advantages for the site of a reservoir, taken in conjunction with lands owned in part by the Water Board and in part by another proprietor, but on account of a line of pipes laid down upon the land in possession of the Water Board the site could not be used for a reservoir unless by someone obtaining Parliamentary powers. In the arbitration the umpire found that if the peculiar adaptability of the land for the purposes of a reservoir was capable of being taken into account, the compensation was to be 1,615*l.*, but if not, then this sum must be reduced by 779*l.*

The Court of Appeal negatived the contention that as the site was not in one ownership its enhanced value could not be regarded, and still more emphatically decided against the contention put forward on behalf of the Water Board, that they as owners of part could, by refusing their consent to the land being used for such a purpose, prevent this element of value from being considered, but the award was referred back to the umpire because it was not clear that he had taken into consideration the question whether there was any possibility of the land being required for the special purpose by any other persons than the Water Board. In other words, the principle of law is this—the special purpose to which the land is to be put by the person who has already obtained compulsory powers cannot be regarded by the arbitrator; he must ascertain whether there is a possibility of any other demand for the land for the special purpose.

In the case in question the umpire had misinterpreted one of the provisions contained in the Acts which made him think that an independent demand existed.

The fact that compulsory powers would have to be obtained by any person adapting the land for the purpose was treated by the Court as immaterial.

Competition News.

BRISTOL ROYAL INFIRMARY.

The assessor, Mr. Edwin T. Hall, has made his award in this matter, with the following result:—First premium, Mr. H. Percy Adams, of London; second premium, Messrs. Henman & Cooper, of Birmingham; third premium, Messrs. Worthington & Son, of Manchester.

Correspondence.

REGISTRATION.

SIR,—I regret to find that a loose word of mine, in my letter published by you on January 16, makes it quite inadvertently open to a construction never intended by me for one moment.

My reference to Sir Aston Webb and others who so ably dealt with the matter was intended to be wholly appreciatory. No one could feel more grateful than I did, and do, to them for the part they played, with such unstinted zeal and conspicuous ability, in reconciling the conflicting interests abroad. But my colloquial use of the word "engineered," which I much regret, might convey a false impression of my meaning of my loyalty to their good work which I never intended, and desire at once to correct.

W. D. CARÖE.

SIR,—Articles, papers, and letters prove that very opposite opinions have equally able and gifted advocates—men who speak from conviction—and I think it may be taken that these opposing energies desire to forward the best interests of British architecture. Might one, therefore, express the hope that by introducing breadth in some quarters and restraint in others a *modus vivendo* could be arrived at with a common flag, under which the Institute, the societies, and associations would be united on absolutely essential principles?

"Ach, Gott! die Kunst ist lang,
Und kurz ist unser Leben."

Secondary principles could still be "agitated" for or propagated—as in municipal and imperial matters—while, irrespective of which party is in majority, the business of the State is carried on.

R. C.

PITCH-PINE.

SIR,—In your review of Mr. Purchase's "Manual of Building Inspection," you imply that pitch-pine is not *Pinus rigida*. In Rivington's Notes it is stated to be so. In *Woods and Forests*, a journal edited, 1883-4 (not since continued), by W. Robinson, it is stated, p. 690, to be *P. rigida*, and on p. 302 *P. rigida* is said to be the Virginian pitch-pine, while *P. ponderosa* is said to be the pitch-pine of North-West America. On p. 25 the pitch-pine is stated to be *P. rigida*, and its habitat given as the east coast of North America. From Maine to west of New York and North California it is said that *P. ponderosa* is called yellow pine. Loudon calls *P. rigida* the pitch-pine (p. 977 of 1869 edition *Arboretum Britan*), and says it grows in New England and Virginia. *P. ponderosa* he does not call pitch-pine, and he says it is a native of the north-west coast of North America. On p. 987, he says *P. australis* is called the pitch-pine in the middle and southern States of America, and by the English timber merchants it is called Georgia pitch-pine. Hurst's Handbook says pitch-pine is *Pinus rigida*, and grown in the swampy districts of southern States of North America.

Perhaps you can obtain the latest botanically-sanctioned name for the timber which architects know as pitch-pine, and incidentally for that known as Oregon pine, which is somewhat similar in appearance.

W. B. HOPKINS.

*** The Bulletins published by the U.S. Department of Agriculture (Division of Forestry) are, in our opinion, the most trustworthy guides to the botanical and common names of the timber and timber trees of the United States. In Bulletin No. 10 the true pitch-pine (*Pinus rigida*) is said to be one of the "small to medium-sized pines, not commonly offered as lumber in the market; used locally for timber, ties, etc." And, again: "'Pitch-pine' includes all southern pines, and also the true pitch-pine (*P. rigida*), but is mostly applied, especially in foreign markets, to the wood of the longleaf pine (*P. palustris*)." In Bulletin No. 13 four species of "southern pines" are described. These species are easily recognised in the forest by their botanical characters, but "difficult and often impossible" to distinguish in the market form of lumber. Different names have been applied to the species by different botanists, and there are about fifty local and market names for the four. The "best common names" and the more important botanical names are given below, together with a general indication of the region where grown:—(1) Longleaf pine (*Pinus palustris* or *australis*); coast region from North Carolina to Texas. (2) Shortleaf pine (*P. echinata* or *mitis*), the common lumber pine of Missouri and Arkansas; North Carolina to Texas and Missouri. (3) Loblolly pine (*P. tæda*); Southern States, Virginia to Texas and Arkansas. (4) Cuban pine (*P. heterophylla* or *cubensis*); along the coast from South Carolina to Louisiana. In the lumber market "longleaf and Cuban pines are never distinguished," and "shortleaf and loblolly pines are mixed indiscriminately." A fifth pine, the marsh or pond pine (*P. serotina*), which grows along the Atlantic coast from Albemarle Sound in North Carolina to the head of St. John's River in Florida, is cut and sold indiscriminately with the loblolly pine. The "pitch-pine" imported into England may therefore be obtained from any of those five species, and a single cargo may contain timber from two or more of them. Oregon pine is, according to Bulletin No. 10, one of the names of the Douglas fir or spruce (*Pseudotsuga douglasii*), one of the most important trees of the western States.—ED.

Re CORNWALL COUNTY OFFICES.

SIR,—The architects who have spent a considerable amount of time and money in submitting designs for this building will be exceedingly surprised to hear that the Offices Committee, without the aid of a professional assessor, have selected nine out of the fifty-nine designs submitted, and placed these nine only before a member of the Royal Institute.

The conditions stated that a professional assessor would be appointed, and that no sum had been fixed as to cost.

In the face of these two facts it is difficult to believe that a body of men could act in such an unfair way as the Committee have done. On receiving the designs they proceeded to throw out all but nine of them, mostly, if not entirely, on the point of cost, for in the meanwhile it would seem that a price (and that a very modest one) had been decided upon, and thus the time, money, and labour of fifty architects has been absolutely wasted.

The conditions required the estimates to be stated in such a way that it would be quite easy for laymen of no professional experience, such as formed this Offices Committee, to jump to the conclusion that the building was too expensive; whereas after full consideration by a professional man these estimates might have been considered perfectly reasonable.

The Committee have, if not callously, at least thoughtlessly, led competitors astray, and should, in common fairness, reconsider their decision and place all the designs before the assessor, and let him select the one he considers the best.

As to the assessor, it is hard to believe that a man of standing and a member of the Institute could allow himself to be placed by any committee in the position he now occupies. Surely he should insist on assessing upon *all* the designs, taking for his sole guide the conditions of competition and the answers to questions. Any later information which was not supplied to every competitor should be rigorously excluded if a fair and impartial decision is to be arrived at.

In support of the foregoing, a cutting from the *Royal Cornwall Gazette* of January 21, which has been received from a friend, runs as follows:—

"The Offices Committee reported that fifty-nine plans had been sent in for the County Offices, and Mr. G. H. Fellowes Prynne was appointed to examine and report on nine selected for submission to the assessor. The Chairman said some of the plans sent in were entirely out of the question—at a price the county would never have accepted. They were ruled out by the Committee. The architects fully understood that economy would be considered. Some plans which were sent in were for very elaborate buildings, costing a great deal of money. These were ruled out by the Committee, and they would not go before the assessor."

The absolute unfairness of these remarks is apparent to those who have read the conditions and the answers to questions. Seeing that the Committee had evidently an approximate price in their minds, was there any earthly reason why they should have withheld this information when promoting the competition?

Cornish *versus* foreign granite is a question often to the fore, and perhaps the quarry-owners will realise that this treatment by a Cornish Committee of fifty architects (some of them leaders in their profession) is not calculated to foster feelings of sympathy with their claims.

"INTERESTED, BUT NOT COMPETING."

*** We entirely agree in the opinion that the assessor ought to have seen all the designs. No architect ought to consent to act as assessor except on that condition.—ED.

THE ARCHITECTURAL TREATMENT OF ABATTOIRS.

SIR,—Will you kindly allow me to correct an error in the report which you published of the discussion after my paper on "Public Abattoirs" read at the Royal Institute of British Architects on the 18th inst.? In your last issue it is stated that the Chairman (Mr. Ernest George, our President) said, "The author had given them examples of sumptuous fittings inside, but an absence of external architectural design, and he was afraid that would never do." These remarks, however, did not refer to me, but to Mr. Sydney Perks, who after my paper was read opened the discussion, and referred to the Islington buildings which he has designed. He frankly admitted they are hideously ugly, but stated that no expense has been spared on the interior fittings. The remarks made by the President are, however, correctly reported in the current number of the Royal Institute of British Architects' *Journal*,

as follows:—"Mr. Perks had given a thoroughly English example of a building made sumptuous inside, but with all attempts at architecture abstained from outside. He was afraid that generally would be the method with us."

I need hardly state that I am thoroughly in accord with this opinion generally, but am sufficiently optimistic to think that these buildings need not necessarily be "hideously ugly."

In the hands of a skilful architect with good materials of pleasing colour at his command, these large, utilitarian buildings, designed with due regard to proportion, should be pleasing in appearance. R. STEPHEN AYLING.

IFIELD COURT, KENT.

SIR,—Ifield Court is a country house or small mansion about three miles south of the town of Gravesend.

The north front is composed of plain, uninteresting stock brick buildings, about a century old. The south front is composed of old Gothic buildings, with thick rubble walls, massive buttresses, octagonal turret, and tile roofs, evidently the remains of some monastic establishment of the Middle Ages.

The house has been untenanted for about twenty years. Recently a farmer has taken the large farm attached to it, and is about to have the house put in habitable repair.

It is now proposed to demolish about half of the ancient buildings, and to build new stock-brick rooms in their place, and I am writing this to ask whether any of your readers think it is worth while making some efforts to save this glimpse of the Middle Ages from being obliterated. If so, there is no time to be lost, as the work of demolition is just being commenced. I do not anticipate any great difficulty in the way of preserving and restoring them, either in the matter of expense or convenience.

This south front has been photographed many times; if any of your readers have photographs of it, perhaps they will be good enough to forward them to you to help form an opinion on this matter.

Messrs. Fooks, Chadwick, Arnold, & Chadwick, of Carey-street, Lincoln's-inn, are the solicitors and co-trustees for the estate. The founder of this firm, the late Mr. G. M. Arnold, of Gravesend, died a few months ago, or he would have been the best man to have appealed to, as he was a member of the Kent Archæological Society, and much interested in the preservation and restoration of ancient buildings. I did not think an appeal to him would have been made in vain. I do not know whether any of the present members of the firm (who are all members of the family), have inherited his amiable hobby, with his other good things. HISTORICUS.

Master Builders' Associations, etc.

YORKSHIRE FEDERATION.

The members of the Yorkshire Federation of Building Trade Employers held their eleventh annual dinner on the 21st inst. at the Great Northern Hotel, Leeds. Mr. W. R. Thompson, the President, occupied the chair, and among those present were the Lord Mayor of York (Alderman J. Birch), the Mayor of Dewsbury (Mr. F. W. Reuss), Mr. A. W. Sinclair, of Scarborough (a former President of the Federation); Mr. A. G. White, of London (Secretary of the National Federation); Mr. J. W. White, of Sunderland (Treasurer to the National Federation); Mr. W. G. England, of Barnsley (a Vice-President of the Yorkshire Federation); Mr. G. F. Bowman, Leeds; Mr. Percy Robinson, Leeds; Mr. A. J. Forsdike, of Sheffield; Mr. W. Irwin, of Leeds; and Mr. J. Davidson, of Leeds (the Secretary).

Mr. A. W. Sinclair, in submitting the toast of "The National Federation," said it had provided an organisation which the trade had long needed, and by its means they had been able not only to approach the Royal Institute of British Architects, but municipal and other councils, and even the Government of the day. More pleasing still was the work it had done in the matter of the operatives. The Federation had been able to cultivate relationships with the operatives by means of which reason had taken the place of the old methods of barbarism. If there was one work with which he was pleased more than another, it was this scheme of conciliation. By means of the National Federation also builders had been able to get from the Royal Institute of British Architects a just and equitable form of contract, which secured to the proprietor, to the architect, and to the builder fair and reasonable terms.

Mr. A. G. White, speaking in reply, said he knew of no county federation which conducted its affairs in a better or more statesmanlike manner than the Yorkshire Federation. Glancing ahead, there were in his view two things which required serious attention. One of them was a national scheme of apprenticeship. From statistical information which had been obtained at headquarters, it was clear that in the building trade the members of the Federation were not making the required number of apprentices in any of the allied trades to make good the losses that arose from death, emigration, accident, and other causes. Builders would remember that the cause of the trouble with the plasterers a few years ago was really the scarcity of apprentices. The trade in France had lately been troubled with a shortage of skilled labour. The President of the Builders' Society of Paris had pointed out that neither the workmen nor the masters cared to take the trouble to make apprentices. On account of the small sum of money paid to apprentices parents preferred to send their children to employment that was more remunerative. They said the law was averse to them, that the specialisation of machinery was inimical to apprenticeship, and that employers themselves had abused the system by putting boys to all sorts of menial work not really connected with their trade. It was argued, moreover, that trade unionists had refused to instruct apprentices, and that there was no means of controlling recalcitrant apprentices. He (Mr. White) was afraid that if they examined matters they would have to admit that a good many of the conditions which applied to France would apply at home. Another problem which would have to receive attention was the abuse of the present compensation law. In France, where a system similar to ours prevailed, the result had been extremely unsatisfactory, and the abuses had become so great that a strong movement was setting in in industrial quarters in favour of an amendment of the law. The abuses took the form of the simulation of injuries, and touting by medical men, with the object of getting as much as possible out of every accident. The result had been that in France there had been a great increase in the number of accidents reported—indeed, as much as 300 per cent. Medical and medicinal expenses per accident had doubled since 1901, and insurance rates had risen from 6 to 12 per cent. He (Mr. White) thought the Federation ought to get prepared. Of course, they could not do anything until they had a case, but by keeping statistical information of all the cases which arose—whether of malingering or of excessive medical or legal expenses—they might at the right time bring an overwhelming case for amendment before the Government.

Mr. J. W. White gave the toast of "The Yorkshire Federation."

The President, in acknowledgment, congratulated his fellow-members on the solid and compact position the Federation occupied. During the past year the Council had been occupied with the Home Office report on building accidents. Some of the clauses it contained would have been very much inimical to the building trade; they would have meant serious expense and increased cost in scaffolding, as well as aggravated the difficulties of carrying on the business by the stringency of the regulations proposed. He (Mr. Thompson) believed that the resolutions passed by the Yorkshire Federation had a great effect on Mr. Gladstone in dropping the proposed regulations during the past session. Another serious menace to the trade was the works departments which many municipal authorities proposed to set up, and there was no doubt that the pamphlet issued by their Secretary (Mr. Davidson), setting forth the cost of these departments, had its effect at the elections which took place in November. He (the President) objected to the building trade being made the dumping-ground for the unemployed. It meant an increased cost of from 50 to 100 per cent., and in some cases the employment of out-of-works had had the effect of displacing good men, who might otherwise have been employed.

Other toasts honoured included "The City and Trade of Leeds," "Architects and Surveyors," and "Guests and Visitors."

PLANING-MACHINE AND SAW-BENCH GUARDS.

AMONG the numerous types of safety devices on the market for the protection of workmen using wood-working machinery, those of Messrs. Glover & Co. present features deserving notice.

The usual section of an ordinary plane cutter block is square, with triangular projections at two corners providing beds for the knife edges, while other projections are represented by the nuts of the bolts by which the knife blades are secured to the block. The result is that the surface of the revolving block is very irregular, hence considerable risk occurs to the attendant when feeding timber up to the cutter. An improved method of construction adopted by Messrs. Glover & Co. is to make the cutter block of circular cross-section, the only irregularity being a thin groove immediately in front of each knife edge. Should the hand of the attendant slip on the round block the injury caused to his hand would be very slight as compared with that inflicted by a similar mishap with an ordinary cutter block. Other advantages claimed for the circular block are that as the knives are merely thin strips of steel a marked saving of material and labour can be effected, that as perfect pressure is brought to bear right up to the cutting edge the blades cut more cleanly and with a superior finish, and that the thin knives are more easily sharpened and are less liable to become unbalanced than ordinary knives.

Glover's "Ideal" circular-saw guard is a device which can be adjusted in various positions for saws of different diameters. The guard proper comprises three parts:—(1) An adjustible hood hinged at the top and resting at the bottom upon the timber which is being fed in front of the saw; (2) a short, thin, curved, double-hinged, steel back-guard blade at the top of the saw; and (3) a long, thin, curved, and hinged rear-guard blade at the back of the saw. The set of guard-plates is held in position at one end of a horizontal shaft whose other end is carried by a jointed block with adjustment screws, and fixed to a bracket which is attached to the back or side of the bench, or may be clear of the table altogether if preferred.

This guard can readily be adjusted for flat or deep cuts with a saw of given diameter, the arrangement of the hinged parts is such that the hood and blades adjust themselves to the curve of anw saw whatever its diameter may be, and the fence may be brought close up to the side of the saw, if required, for cutting thin boards.

LONDON BOROUGH COUNCILS.

Battersea.—The Finance Committee have taken the views of the several committees concerned on the question of fixing consumers' meters in the residences provided by the Council for officers, to record the amount of electricity consumed in such residences. As a result the Lighting Committee is to be requested to provide meters for all residences not at the present time fitted with separate meters, at the usual annual meter rent.

Deptford.—In view of the extra work thrown upon Messrs. Ruddle & Cutler, of the Surveyor's department, since the late Surveyor's retirement, and previously, during Mr. Corfield's protracted illness, the General Purposes Committee have decided in favour of each officer being granted a gratuity of 25*l.* The granite pavement in Edward-street is to be extended, second-hand setts to be used. The cost of labour and of the other materials is estimated at 184*l.*

Finsbury.—Cleaning and repainting is to be carried out at the Wharf-road depôt. A communication was received at the last meeting of the Borough Council from the Shoreditch Borough Council in regard to the proposed widening of Old-street, and asking if Finsbury would be prepared to make up and pave certain land eastward of City-road, offered by the Ecclesiastical Commissioners, if Shoreditch would maintain the same afterwards. It was decided to reply in the negative.

Hackney.—The footways in Wick-road, between Montague-terrace and Berkshire-road, are to be repaired at an estimated cost of 320*l.* The works in Holmleigh-road have been completed at an actual cost of 1,628*l.* 5s. 5d., compared with the estimated cost of 1,896*l.* 19s. 7d. The London County Council are about to commence the construction of a public convenience for women near the centre of Hackney Downs. The Council have decided to withhold their consent to the London County Council Tramways and Improvements Bill, 1909, so far as it relates to the proposed construction of tramways at Englefield-road, Stamford-road, Kingsland-road, Ridley-road, and Dalston-lane, and also along Victoria Park-road. Mains are to be extended, at a cost of 100*l.*, for supplying electricity for lighting, heating, and battery charging at 43, East-bank.

Hammersmith.—In consequence of the increase in the charge for water required for working the hydraulic lift at the Town Hall, the Committee in charge of the building have decided in favour of the conversion of the working power to electricity. The cost of water under the new scale would be 21*l.* per annum, whereas it is estimated that the cost of the current should not exceed 8*l.* The capital expenditure is put down at 168*l.* Negotiations are proceeding smoothly with regard to detail matters in relation to the suggested gift by the Ecclesiastical Commissioners of land abutting

on Sawley-road for the purpose of a recreation-ground. Trees are to be planted in eleven roads subject to a grant being received from the Central (Unemployed) Body. Steps are to be taken to have portions of the footway on the east side of Wood-lane paved, and the Surveyor has prepared plans for making up and paving as a new street Old Oak-road, between Uxbridge-road and a point north of Aldbourne-road. The Electricity Committee has been authorised in connexion with supplies to future exhibitions at Wood-lane to provide transformers, etc., at a cost of 575*l.*, and if deemed essential, an additional main. If the last-mentioned work is required the total cost will be brought up to 2,025*l.*

Holborn.—The sum of 28,030*l.* has been received from Sir William P. Hartley, the balance of the purchase-money for the sale to him of the Holborn Town Hall. The Works and General Purposes Committee have decided in favour of paving and sewering work being carried out during the ensuing year at a total cost of 8,003*l.*; 4,206*l.* of this is for paving work, the largest item being for laying 2-in. compressed asphalt in the Tottenham Court-road at an estimated cost of 2,196*l.*, and laying the same material in a portion of Leather-lane at a cost of 987*l.* The granite setts on the west side of Lincoln's Inn-fields are to be taken up, and tar-macadam laid down at an estimated cost of 813*l.* The largest sewer work is to be in Chancery-lane, where a new 4 ft. by 2 ft. 8 in. brick sewer is to be made at an estimated cost of 2,340*l.*

Lambeth.—A sewer in Norwood-road is to be reconstructed at an estimated cost of 500*l.* The sum of 157*l.* is to be spent in constructing a new urinal in Brixton-road, near Loughborough-road. Messrs. Hibberd Brothers, Ltd., are to carry out general repairs at the North Lambeth Library at 543*l.* Messrs. Wakeford & Sons are the architects.

Lewisham.—The total cost to the Borough Council to date in connexion with street widenings and improvements for tramways is 62,239*l.*, in almost exactly equal proportions for paving work and for cost of widenings. With reference to the proposal to construct a bridge over the River Quaggy at a point abutting on property in the Lee High-road (acquired in connexion with the tramways), and by this means improving the value of this property for building purposes, the Borough Engineer suggests that the area of the site be extended by putting iron columns in the middle if the river, and a skeleton framework of girders to support the walls of any proposed structures. The General Purposes Committee, having considered the project, are of opinion that the site, with the suggested extension, would be suitable for the erection of a central post-office, and they have directed that a copy of the plan, with the Surveyor's report, be forwarded to the Postmaster-General. Ravensbourne Park, from Catford-hill to Manwood-road, is to be paved as a new street.

Marylebone.—The Works Committee, having made their usual annual inspection of the various thoroughfares in the borough, have decided that the following paving works are to be carried out during the year to end March 31, 1910:—Wood-paving renewals, 4,790*l.*, divided as follows: Vere-street, 547*l.*; High-street, Marylebone, 2,037*l.*; part of Marylebone-road, 509*l.*; Thayer-street, 647*l.*; Lower Berkeley-street, 663*l.*; part of Chapel-street, 387*l.* Wood paving to be substituted for macadam: Great Cumberland-place, from Oxford-street to Upper Berkeley-street, 2,150*l.*; Finchley-road (that portion in the borough not already wood paved), 2,727*l.*; Upper George-street, from Edgware-road to the east side of Brown-street, 1,100*l.*; entrance to Devonshire-mews South, 40*l.* Asphalt to be substituted for granite: part of Barrett-street, 263*l.*; Homer-street, 607*l.* Granite pitching is to be substituted for macadam around the convenience in St. John's Wood-road at a cost of 143*l.*

Poplar.—Messrs. Nicholds & Reynolds's tender of 297*l.* has been accepted by the Borough Council for the erection in reinforced concrete of workshops, messroom, and lavatory and storeroom at the Central Station of the electricity undertaking. The estimated cost of the scheme, with the necessary fittings and machinery, is 649*l.* 4s. Messrs. Thwaites Brothers are to clean and paint the four dials and gild the hands, figures, etc., with 23-carat goldleaf, of the public clock at All Saints' Church, for 27*l.* 10s. The London County Council have informed the Council, in regard to a suggestion that tall brick shafts should be erected over the open ventilators to the northern outfall sewer, that after consideration they are unable to see their way to adopt the proposal. In view of the nuisance, however, the London County Council are again to be urged to carry out the work.

Stepney.—Electric mains are to be laid in Stainsby-road, Limehouse. The Borough Engineer has been instructed to carry out the work of constructing carriageway entrances to the premises of Mr. J. Wooler, Talford-street, and carriageway crossings at the premises of the Co-operative Wholesale Society, Ltd., Leman-street, and at 114-120, Elsa-street, for Mr. W. Buckley. Subject to the Central (Unemployed) Body providing the wages, and the London County Council contributing half the cost of the material, and subsequently a third of the cost of maintenance, silent paving is to be laid in front of four schools (Hanbury-street, Settles-street, St. Mark's, Royal Mint-street; and St. Patrick's).

Wandsworth.—The new part of Wimbledon-road lying between Garratt-lane and the borough boundary is to be paved by Mr. Thomas Adams, the contract price being 672*l.* The Borough Engineer has prepared plans for a mortuary and coroner's court on a portion of the land acquired for the purposes of Wandsworth Cemetery, adjoining Earlsfield Station. The estimated cost is 4,105*l.* The Borough Engineer has also prepared alternative plans for a mortuary only at Ram-square, the cost of which is put down at 3,410*l.* Before proceeding, however, in the matter, the London County Council are to be asked, in the event of the Council erecting the proposed mortuary and coroner's court at the Wandsworth Cemetery site, what amount they would be prepared to pay for the use of the court, and for what period they would agree to use the same.

Woolwich.—The Medical Officer of Health, at the meeting of the Borough Council on January 21, called attention to the fact that the Building Act contains insufficient requirements for securing light to new houses, and that it is possible for houses to comply in all respects with the Act and yet to be very unhealthy as regards light and access of air. In several instances new houses were erected so as to shut off the light from opposite houses. He suggested that the County Council be asked to take steps to extend the provision of the Public Health Acts, which prevent the occupation of new houses until they have been certified to have a proper water supply, so as to include regulations for other sanitary requirements. It was decided to send a copy of the report to the Spring-gardens authority. The sum of 100*l.* is to be spent in painting works. The London County Council is to be again urged to carry out street improvements in connexion with the widening of Woolwich-road. They are further to be asked to amend their Tramways Bill so as to make it compulsory upon the Greenwich Borough Council to contribute one-sixth of the cost of widening the road where the boundary of their borough runs down the centre.

THE COURT OF COMMON COUNCIL.

A MEETING of the Court of Common Council was held at the Guildhall on Thursday last week, the Lord Mayor presiding.

Clearance of Snow.—A motion was moved by Mr. Deputy Millar Wilkinson to the effect that it should be referred to the Streets Committee to consider and report as to the efficiency of the staff employed to deal with exceptional falls of snow. The motion was adopted.

Guildhall Improvement Scheme.—On a proposal to re-elect Mr. W. H. Williamson a member of the City Lands Committee reference was made to a comprehensive scheme of improvement which it is proposed to carry out eventually at the Guildhall. Mr. Williamson was some time ago elected to this Committee for the sole purpose of watching any structural improvements that might be suggested, the object being to avoid any interference with, and also to consider tentatively, the larger scheme. Mr. Williamson, in a speech summarising the steps that had been taken, said that a special subcommittee had been appointed to consider the subject, and a voluminous report had been prepared by the Surveyor. Mr. Deputy Monton, M.P., said he objected to the planning of the scheme being left in the hands of one official. Such a scheme should be referred to the most eminent talent in London before any play was drawn up. The City Surveyor, replying to several members, said that he had only prepared plans showing the present state of the building, and that he had drawn up a report on the subject. Mr. Gunton, while expressing a high appreciation of Mr. Williamson's abilities, thought there were other members of the Court who, being architects, would be able to render more valuable assistance on this particular Committee. Eventually it was decided not to reappoint Mr. Williamson on the Committee.

Improvements at Billingsgate.—In reply to a question on the proposal to spend 11,000*l.* on improvements at the Billingsgate Market (which the Court have already agreed to), the City Surveyor stated that the matter was in the hands of the City Engineer, who would prepare the plans and specifications, certain firms being afterwards asked to tender.

PROJECTED NEW BUILDINGS IN THE PROVINCES.

BIRKENHEAD.—Workshop. Messrs. Grayson & Ould, architects, Pacific-buildings, 31, James-street, Liverpool.

Blackpool.—Hydropathic establishment. Mr. W. A. Thomas, architect, 14, Dale-street, Liverpool.

Bodmount.—Hall. Messrs. Grayson & Ould, architects, Pacific-buildings, 31, James-street, Liverpool.

Bridlington, Yorks.—Enlargement of High School for Girls (6,650*l.*). Mr. J. Bilson, architect, Parliament-street, Hull.

Burnley.—Proposed construction of skating-rink by Messrs. Factors, Ltd.

Chester-le-Street (Durham).—Public convenience. Mr. Ayton, architect, Borough Engineer.

Chester.—Municipal buildings. Mr. T. Lockwood, architect, Foregate-street, Chester; Messrs. J. Mayer & Sons, builders, Canal-slide, Queen-street, Chester.

Coventry.—School, Windmill-lane. County Surveyor, Mr. J. Willmott, Warwick; builder, Mr. A. Lord, Coventry.

Darlington.—New subway (4,000*l.*). Borough Surveyor, Mr. G. Winter, Darlington.

Dudley (Worcester).—School. Mr. T. Glazebrook, architect, Dudley and Stourbridge.

East Riding (Yorks).—Additions to County Hall (225*l.*), Architect, County Council, Beverley; proposed new schools at Barlby, Stamford Bridge, Sutton, Wawne, Withernsea, and Foggathorpe, also school extensions at Norton, Rye Hill, Thwing, and Walkington, Mr. Bernard B. Stamford, Building Surveyor, County Hall, Beverley.

Epsom.—Workshops, for the Governors of Epsom College.

Erdington.—School. Mr. J. Willmott, County Surveyor, Warwick.

Ferryhill.—Church. Messrs. Davidson & Sons, architects, Newcastle-on-Tyne; Messrs. Stafford & Sons, builders, Sunderland.

Garston (Liverpool).—Schools. Mr. E. Ware, architect, Exchange-street East, Liverpool.

Glasgow.—School, Hyde Park. Messrs. Dykes & Dale, architects, 65, West Regent-street; Messrs. Meiklejohn & Son, builders, Glasgow.

Liverpool.—Schools, Galdys-street, Liverpool, Mr. W. Sproat, architect, 18, Cook-street, Liverpool; cold storage warehouses, Messrs. Deacon & Horsburgh, 81, George-square, Liverpool; school, Messrs. Bradbury & Son, architects, Cork-street, Messrs. W. Hall & Son, builders, Liverpool; dairy premises, Mr. W. Hulme, Liverpool.

Mansfield.—Police-station. County Surveyor, Shire Hall, Nottingham.

Mitcham (Surrey).—New depôt, Homewood-road (767*l.*). Mr. J. S. Killick, Surveyor to Croydon Rural District Council.

Oldham.—Tramway depôt buildings. Mr. E. C. Foote, Borough Surveyor, Town Hall, Oldham.

Perdeen (Cornwall).—School. Mr. S. Hill, architect, Redruth; Mr. J. Miners, builder, Marazion, Cornwall.

Radlett.—County school. Mr. A. R. S. Hallidie, Secretary, Herts Education Committee.

St. Albans.—Proposed adaptation of public library building for higher education purposes. County Surveyor, Shire Hall.

South Shields.—Additions to baths and washhouses. Mr. J. Morton, architect, King-street, South Shields.

Staines.—Building at Shooting Park, Poyle, for Messrs. Cogswell & Harrison, 226, Strand, W.C.; rebuilding The Bell public-house, for Messrs. Nowell Parr & Kates.

Sutton.—Police-station. Mr. E. P. Hooley, architect, Shire Hall, Nottingham.

Swansea.—Conversion of chapel, Castle-street, to lock-up shops, for the Liverpool, China, and India Tea Company; additions to Grosvenor Hotel, College-street.

Waldridge.—School (3,000*l.*). Mr. W. Rushworth, architect, Shire Hall, Durham.

Wallingford.—School. Mr. E. Fisher, 19, Buckingham-street, Strand, W.C.

Walsingham.—Secondary school (10,000*l.*). Mr. W. Rushworth, architect, Shire Hall, Durham.

Wavertree (Liverpool).—Church. Mr. W. Owen, architect, Castle-street, Liverpool; Messrs. Morrison & Son, builders, Wavertree.

PRIMARY HIGH SCHOOL EXTENSION, DUNFERMLINE.—A new primary department and gymnasium are to be added to the Primary High School. Competitive plans sent in by Mr. D. Barclay, architect, Glasgow, have been adopted. The walls will be of brick and roughcast. Hot-water pipes and radiators will supply heat, and roof ventilation will be assisted by electric exhaust fans. Provision will be made for an extension if required. The primary department is estimated to cost 3,370*l.*, the gymnasium 1,600*l.*, and sheds, etc., 400*l.*—a total of 5,370*l.*

Obituary.

MR. BOYCE.

The death, on January 20, in London, is announced of Mr. Robert Henry Boyce, C.B., aged 75 years, late Principal Surveyor to H.M.'s Office of Works. Mr. Boyce, a son of Dr. R. J. Boyce, of Myshall, Co. Carlow, entered the Royal Engineers' civil department as a qualified surveyor. After five years' service under the Defence Commission he, in 1866, went as the assistant of General Sir William Crossman, R.E., for the erection of quarters and offices for the consular and diplomatical staff in Japan and China. He succeeded General Sir William Crossman in charge of the works there, and, having been then appointed as surveyor of similar buildings in various parts of the world, was made a principal surveyor, H.M.'s Office of Works. The Companionship of the Order of the Bath was conferred upon him nine years ago.

MR. HILL.

Mr. Walter Hill, a member of the firm of Messrs. John Thompson & Co., of Peterborough, died at Hever, Kent, on January 17, aged 60 years. Mr. Hill's connexion with the firm began in 1865; he became a partner after the death of Mr. John Thompson, in April, 1893. He was thus closely associated with the work of the firm during a long period, comprising the restoration of Bangor, Canterbury, Chester, Hereford, Lichfield, Lincoln, Llandaff, Peterborough, Ripon, Rochester, Salisbury, and Winchester Cathedrals; the building of the Royal Holloway College near Cooper's Hill, Westminster Church-house, and the Royal College of Music, Kensington; the extensions made to the private apartments, Sandringham; and the erection of the tower and spire of the American church in Paris. The funeral service at Peterborough on January 21 was attended by his son, Mr. William Hill; his brother, Mr. George Hill, and his partners, Mr. T. J. and Mr. W. S. Thompson; Mr. F. L. Pearson, of Hever, the architect; and by more than 200 of the workmen of the firm living in Peterborough, with many foremen representing those who are now employed upon works of the firm at Winchester and several other places.

General Building News.

BAPTIST CHURCH, WESTON-SUPER-MARE.

The congregation of Clarence-park Baptist Church have just opened the first section of a scheme for providing a new building in the Walliscote-road. Messrs. Silcock & Reay, of Bath, were responsible for the preparation of the plans. The accommodation just erected includes a school chapel, a classroom, cloakrooms, church parlour, minister's, deacons', and choir vestries, etc. The cost of the completed section (including site) has been 3,000*l.*, and when the church itself has been erected the expenditure will have been 6,000*l.*

CHURCH, RYE PARK, ESSEX.

A new church has been built at Rye Park. The building consists of a nave of three bays and two aisles, two transepts and central tower at intersection of transepts and nave, chancel, organ-chamber, and clergy and choir vestries, with entrance porch to same. There are also two porches at the west end of the church. The building is heated by Mr. John Grundy's hot-air system. The cost of the complete church will be about 6,000*l.*, and the accommodation about 700. The portion of the church at present erected consists of the nave, one aisle, one porch, and the tower and turret staircase up to the nave roof level, the lower portion of the tower being used as a temporary chancel, and a temporary wooden vestry erected on the site of one of the transepts. This first portion accommodates about 340 persons. The contractor for the work was Mr. J. A. Hunt, of Hoddesdon, and the whole has been erected from the design and under the direction of the architect, Mr. Dudley Newman, of Westminster.

TWYFORD PARISH CHURCH.

The Vestry of Twyford, Berks, has authorised the vicar and churchwardens to apply for a faculty to enlarge the parish church at the east and west ends, in accordance with plans drawn up by the architect, Mr. Stallwood, and also to complete the tower when funds shall be available. By the enlargement of the west end of the church sixty or seventy more sittings will be added. The general scheme also provides for the erection of a large west window, the enlargement of the chancel, and the making of a small addition to the vestry. A new organ-chamber has been built, at a cost of 500*l.*, as a private gift, and now provision of funds has to be made for the heating and lighting of the church, the removal of the organ to the new chamber, the completion of the tower, and the setting up of the bells.

U.F. CHURCH, KIRKHILL, N.B.

A new United Free Church has been built at Kirkhill. The building, which is seated for over 300, was designed by Mr. Robert J. Macbeth, architect, Inverness. The total cost is 1,250*l.*

COUNCIL SCHOOL, MERRYWOOD.

A new Council elementary school has been opened at Merrywood, Southville. The school provides accommodation for 500 scholars of both sexes, and consists of ten classrooms, each for fifty children, grouped around a central hall. Cloakrooms for both sexes and teachers' room are also included in the scheme. The materials used are brindled bricks of local manufacture, relieved by quoins, copings, etc., of orange rubber bricks. The architect was Mr. H. Dare Bryan, and the contracts for building and furnishing were let as follows:—Builder, Mr. A. J. Colborne, 5,313*l.*; plumber, Mr. A. S. Scull, 279*l.*; heating, Messrs. W. J. Spry & Co., 338*l.*; electric lighting and ventilating, Messrs. P. Jolin & Co., 206*l.*; and furniture, Mr. R. Palmer, 252*l.* The total loan to cover cost was 7,205*l.*

SCHOOL EXTENSION, LANDKEY, DEVON.

The Wesleyan schools at Landkey have been enlarged. The additions comprise a new classroom, cloakrooms, stores for fuel, etc. The plans were prepared by Mr. A. Lauder, architect, of Barnstaple, and the work performed by Mr. Jno. Southwood, of Landkey.

HIGHER-GRADE SCHOOL EXTENSION, TROON.

An extension has been made to the Troon Higher-grade School. It comprises twelve classrooms, science-room, art-room, and cookery-room. The main front is towards Academy-street, to which it has a frontage of 155 ft., the depth from back to front being 63 ft. The buildings are of red sandstone, slated with Westmorland green slates. The internal finishings are of Cyprus wood. The architect for the work is Mr. James Miller, A.R.S.A., Glasgow.

SCHOOL ENLARGEMENT, SOUTHMOLTON.

Additions have been made to the boys' section of the Southmolton United Schools. The plans were prepared by Mr. A. Lander, of Barnstaple, Mr. F. J. Sanders (Sanders & Son), of Southmolton, being entrusted with the contract for the work. The total cost is estimated at 2,000*l.*, the scheme including the provision of four large classrooms, to be used also for the science and art schools and the continuation classes.

COUNCIL SCHOOL, ECCLES.

A new school has been opened in Clarendon-road by the Eccles Education Committee. It is a structure of red brick and grey terra-cotta, and has been built by Messrs. Ramsbottom, of Pendleton, from plans by Mr. H. Lord, architect, of Manchester. Accommodation is provided for 800 scholars on two floors, with separate entrances for boys, girls, and infants. The mixed department will consist of 520 scholars, of whom 400 will be accommodated on the upper floor. The remaining 120 will be taught on the ground floor, where the infants' department will be accommodated. The estimated cost of the building and furniture is 11,500*l.*

COUNCIL SCHOOLS, ASH VALE.

The opening has just taken place of new Council schools at Ash Vale. The premises are built to accommodate 250 children, and the total cost will be about 5,000*l.* The architects were Messrs. Jarvis & Richards, of Westminster, and the builders Messrs. Martin, Wells, & Co., of Aldershot.

SECONDARY SCHOOL, COALVILLE.

A new secondary school is in course of erection in Forest-road, Coalville. The work is being carried out by Messrs. W. Corah & Son, of Loughborough, at a cost of 7,250*l.*, from the designs of Messrs. Barrowcliff & Alcock, architects, of Loughborough. Accommodation will be provided for 204 boys and girls, and provision will be made for instruction in art, science, woodwork, ironwork, domestic science, etc.

SCHOOL, BIDDULPH MOOR.

A new school has been built by the County Education Committee at Biddulph Moor. The premises, which were designed by Mr. J. Hutchings, the County Surveyor, and executed by Messrs. Jas. Heath & Son, of Leek, are of red brick, with copings, facings, heads, and sills of dressed local stone, and are roofed with red tiles. The heating is on the low-pressure hot-water principle by means of pipes and radiators supplied from a boiler in the basement, Mr. Truswell, of Newcastle, Staffs, being the contractor for this work. The total cost has been nearly 4,000*l.*, and the accommodation is for 316 scholars.

COUNCIL SCHOOL, BEDMINSTER.

The new Parson-street Council school, Bedminster, has just been opened. The school is divided into two departments—senior, for 500 scholars, and junior, for 530—and there is provision for extensions. In all the school has cost something like 20,000*l.* The building contract was carried out by Messrs. E. Walters & Son, and the plumbing and sanitary work was done under direct contract with the Committee by Messrs. John Wilkins & Sons, of St. Paul's. Mr. H. Williams, architect, was responsible for the plans.

HIGHER ELEMENTARY SCHOOL, HILLHOUSE, HUDDERSFIELD.

A higher elementary school has been built in connexion with the Hillhouse Council School. The building is two stories high, the exterior built of pitch-faced wall-stones from Elland Edge Quarries, with ashlar dressings from Crosland Hill. The roofs are slated with light sea-green Westmoreland slates, with red ridge tiles, and all eaves overhanging. The total accommodation provided for is 430 pupils. The whole of the internal fittings are of redwood, stained and varnished. The work has been carried out by the following contractors, viz.:—Excavator, mason, and bricklayers' work, Mr. Mark Brook, Huddersfield; carpenter and joiner, Mr. Henry Holland, Huddersfield; slater, Messrs. Thomas Longbottom & Sons, Huddersfield; plumber and glazier, Messrs. E. Bould & Son, Huddersfield; plasterer, Messrs. W. E. Jowitt & Son, Huddersfield; electrician, Messrs. E. Bould & Son, Huddersfield; heating engineer, Messrs. E. Bould & Son, Huddersfield; painter, Mr. Herbert Booth, Huddersfield; furnishing, North of England School Furnishing Company, Darlington; cloakroom fittings, locks, etc., Mr. James Gibbons, Wolverhampton; window blinds, Messrs. J. H. Taylor and Co. Huddersfield; ventilating; Messrs. Robert Boyle & Son, London. The buildings, fittings, etc., have been carried out from the designs of Mr. K. F. Campbell, M.Inst.C.E., M.I.E.E., Borough Engineer. The estimated cost of the building is 8,354*l.* 4s. 11d.

PUBLIC OFFICES AND FIRE-STATION, CARSHALTON.

The new offices of the Urban District Council of Carshalton, with fire-station adjoining, have been opened. The contract price for the two buildings was 1,864*l.*, and the cost of the site, etc., will make the total about 2,500*l.* The brickwork is of broken red, and the roof is covered with Precelly slates. Mr. R. Frank Atkinson has acted as the senior architect of the work, and he has worked throughout with Mr. W. Willis Gale, A.M.Inst.C.E., Engineer and Surveyor to the Council, who has personally superintended the erection of the buildings. Messrs. Truett & Steele were the contractors.

BRANCH LIBRARY, BIRKENHEAD.

The new Birkenhead South Branch Library, just opened, occupies a site in Grove-road, Tranmere. It has a frontage of 50 ft. and a depth of 76 ft., and is built of brick faced with Storeton stone. The cost of the building, which is the gift of Mr. Andrew Carnegie, must not exceed 2,500*l.* The architect is Mr. J. R. Mewton.

BENEFIT SOCIETY'S OFFICES, TIPTON.

The Midland Counties Mutual Benefit Society have erected new offices in Priory-street, Tipton, at a cost of about 7,000*l.* The premises have a brick front with terra-cotta dressings, and contain twenty-three offices in all. Mr. A. Gammage, architect and surveyor to the Society, was the author of the plans, and Mr. R. J. Guest was the builder.

PROPOSED EXTENSIONS TO PUBLIC BATHS, HARROGATE.

Mr. F. H. Tulloch, M.Inst.C.E., recently held an inquiry respecting an application by the Harrogate Corporation to the Local Government Board for sanction to borrow the sum of 8,850*l.* for the purpose of extending the bathing accommodation of the Royal Baths, and making better provision for the administration of the Plombiere, Greville, D'Arsonval, and peat baths. In the course of the inquiry Mr. F. Bagshaw, Borough Engineer, explained the plans to the Inspector.

BANK, ALNWICK.

In connexion with the amalgamation of Lambton & Co. with Lloyds Bank Ltd., the premises of the latter firm are to be enlarged by the acquisition of adjoining premises lately belonging to the North-Eastern Bank. Internal alterations are to be made, comprising new strong-rooms, banking-hall, etc., in addition to the provision of two suites of offices and a manager's house. A new front is to be erected, the chief feature of which will be an Ionic order embracing the first and second floors. The architect is Mr. George Reavell, jun., of Alnwick and Morpeth.

PROPOSED NEW BUILDINGS IN ABERDEEN.

The Plans Committee of the Aberdeen Town Council has passed the plans of the following:—Alterations and additions in connexion with the City Hospital, for the Town Council, Mr. John Rust, City Architect; alterations in connexion with the building in Guild-street, formerly known as Her Majesty's Theatre, for the Robert Arthur Theatres Company, Ltd., Messrs. Brown & Watt, architects; alterations and additions in connexion with the dwelling-house, No. 388, Great Northern-road, for Mr. R. M. Falconer, grocer; alterations in connexion with premises on the north side of Drum's-lane, for Mr. David Reid, pawnbroker, Mr. George Coutts, architect; alterations and additions in connexion with University Bar, Sinclair-road, for the Town Council, Mr. John Rust, City Architect; additions to granite works on the north side of Regent Walk, for Mr. J. K. Milne, granite merchant, Mr. Duncan Hodge, architect; additions to stable on the south side of South Esplanade West, for Mr. Henry Cabel, carting contractor, Mr. G. H. Jolly, architect; shed at Provost Blaikie's Quay, for Robert Millar & Sons, Ltd., timber merchants, Mr. George Bennett Mitchell, architect; van-shed in lane running from Osborne-place to Desswood-place, for Mr. W. M. M'Pherson, baker, Messrs. Wilsons & Walker, architects; alterations and additions in connexion with the premises Nos. 147-151, George-street, for Mr. Isaac Benzie, warehouseman, Mr. Arthur C. Bruce, architect; fish-curing premises on the west side of Raik-road, for Mr. Charles Goodall, fish curer, Messrs. Cameron & Watt, architects; alterations in connexion with premises at Regent-road, for the North Line Steam Fishing Company, Ltd., Messrs. Kelly & Nicol, architects.

NEW MUSIC-HALL, WIGAN.

A company, known as the Wigan Entertainments Company, are erecting a new music-hall on a site in Library-street. One of the principle features of the building is the width of the roof and the entire absence of centre columns. In order to achieve this result, the whole weight of the roof is carried on four specially-designed steel principals 113 ft. clear span between the walls, and which are built up of rolled steel tees and angles, riveted together by means of gusset plates. The crowning feature of this structure is a steel dome 24 ft. diameter, surmounted by a smaller hemispherical dome (on which is placed one of Shorland's latest extractors), the top of which is 85 ft. above the ground level. The whole of the steelwork has been designed, manufactured, and is being erected by Messrs. J. Booth & Sons, Hulton-lane Steelworks, Bolton; the brickwork and woodwork by Messrs. J. Johnson & Son, Wigan; and the cement and plaster work by Messrs. J. B. Johnson & Co., Liverpool. The architects are Messrs. John B. & W. Thornley, Wigan and Darwen.

POLICE-STATION, HARLOW.

A new police-station has been completed at Harlow, Essex. It has cost about 3,700*l*. The architect was Mr. Frank Whitmore, of Chelmsford, the County Architect; the contractors, Messrs. J. Parren & Sons, of Erith; and the foreman, Mr. J. Mortlock, of Cambridge.

NEW SCHOOL, COVENTRY.

The "John Gulson" School, a large block of new buildings erected in Leicester-causeway, Coventry, has just been opened. Mr. Frederick Foster was the architect for the work, which has been carried out at an expenditure of about 18,000*l*.

CLUB PREMISES, EVESHAM.

The members of the Evesham Unionist Club recently acquired the Deacle School buildings in Bengeworth, and these they have now had converted into premises suitable for the club. The work of remodelling has been carried out from the plans of Mr. G. H. Hunt by Messrs. Espley & Co., Ltd., a local firm of builders.

DENTAL HOSPITAL, LIVERPOOL.

The ceremony of laying the foundation-stone of the new Dental Hospital to be built at the corner of Pembroke-place and Boundary-place, Liverpool, took place on the 16th inst. The building is being erected, from the plans of Mr. G. de C. Fraser, architect, by Messrs. Hughes & Stirling, builders, who have secured the building contract at a sum of under 8,000*l*.

PROJECTED IMPROVEMENTS, BEXHILL.

The Town Council of Bexhill have sanctioned a scheme for laying out a new parade in the centre of the sea-front. A prominent feature will be a covered colonnade, semicircular in shape, with an open-air bandstand and accommodation for 1,200 people. The design is by Mr. J. B. Wall, and the estimated cost of the scheme is 13,000*l*.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.

Messrs. Ernest Runtz & Ford, architects, have removed their offices from 10, Walbrook, to 64, Victoria-street, Westminster, S.W. Their telephone number will be 7924 Gerrard.

MUNICIPAL BRICK AND FLAG MAKING.

The Electricity and Lighting Committee of the Fulham Borough Council has drafted a special report on the brick and flag making industry, which, after a long period of suspension, was recommenced on May 14 last. The Borough Electrical Engineer reported, as the result of six months' working, that there was a total, over all working costs, inclusive of annual capital charges, amounting to 1,170*l*. 13s. 1d. Considerable improvements have recently been effected in connexion with the plant, and the slabs now manufactured are regarded as equal to, if not better than, any other composite slab made. The cost of production is also most satisfactory, and less than the average price upon which the estimates were based. The Engineer is of opinion that there will be little or no difficulty in disposing of the flags at a reasonable price. Having regard thereto, and in view of the expenditure of time and money inevitably involved in necessary repairs and cleaning, after closing down for a time before the machinery can be successfully restarted, the Committee are of opinion that authority might now be given for the plant to be continued running, so as to complete a full twelve months' working. In the meantime the Engineer should be authorised to dispose of the slabs at prices to be settled by the Committee from time to time. They have been influenced in arriving at this decision very largely by the fact that, in any event, the Council will have to find a sum of 357*l*. annually out of the rates for the repayment of principal and interest on loans in respect of this plant for the next few years, added to which there is the fact that the slabs now being made were of the most satisfactory description, and if placed on the market and sold in any sufficient quantity the process provides a very profitable means of disposing of the clinker from the dust destructor. The Committee submit recommendations for continuing the working of the plant and for authorising the disposal of the slabs at market prices, provided that the minimum price shall not be less than 3s. per square yard, with an allowance of 10 per cent. discount for a minimum quantity of 100 sq. yds.

ALUMINIUM.

In the course of a discussion at the meeting of the Institute of Metals, held at the Institution of Civil and Mechanical Engineers, on Tuesday, on "Aluminium," some interesting facts were given regarding the development of the industry, and it was stated that, whereas twenty years ago only 3 tons of the metal was used, last year over 30,000 tons were produced. The author of the paper, Mr. J. T. W. Echevarri, M.Inst.M.E., alluded to the increasing use of aluminium in the electrical industry, and said that wall "paper" and ceiling panels made of very thin embossed sheet was a refinement of modern art, the use of which was likely to become more general now that the price of the metal had been reduced, as such a covering was not only fireproof, but could be washed, and was much more durable than ordinary wall-paper. Aluminium powder was being used to an increasing extent in the manufacture of metallic paints and varnishes, its non-tarnishing qualities making it particularly suitable for these purposes. Aluminium paint was being used extensively for protecting ironwork, rendering the latter to a certain extent fireproof if a good thick coating be applied. There also appeared to be a field for aluminium for galvanising purposes, by introducing small quantities of the metal into the bath, rendering it more fluid, and consequently enabling a larger surface to be galvanised with a given quantity of zinc, and at the same time producing a brighter finish than was otherwise obtainable.

CHURCH BUILDING SOCIETY.

The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on the 21st inst. at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Lightbourne, St. Luke, near Manchester, 150*l*.; South Wimbledon, St. Andrew, Surrey, 150*l*., for the first portion; Sunnyside, St. Michael, near Berkhamsted, 110*l*.; Sutton-in-Ashfield, St. Michael and All Angels, Notts, 65*l*.; East Cowton, All Saints, near Northallerton, 60*l*.; Leeds, St. Margaret, 210*l*.; Longwell Green, All Saints, near Bristol, 80*l*.; Mansfield St. Lawrence, Notts, 100*l*.; and Plymouth, St. Gabriel, 200*l*.; towards rebuilding the church at Starbeck, St. Andrew, near Harrogate, 40*l*.; and towards enlarging or otherwise improving the accommodation in the churches at Cherington, St. John the Baptist, Warwickshire, 25*l*.; Gaywood, St. Faith, near King's Lynn, 80*l*.; Kentish Town, St. Benet and All Saints, Middlesex, 100*l*.; Old Romney, St. Clement, Kent, 25*l*.; Pilsley, St. Mary the Virgin, near Chesterfield, 15*l*.; Pwllheli, St. Peter, Carnarvonshire, 50*l*.; Tibberton, Holy Trinity, near Gloucester, 25*l*.; Camden Town, St. Michael, Middlesex, 30*l*.; Johnston, St. Peter, near Milford Haven, 30*l*.; Kessingland, St. Edmund, near Lowestoft, 45*l*.; Lavenham, St. Peter and St. Paul, Suffolk, 100*l*.; and Newcastle-on-Tyne, St. Augustine, 80*l*. Grants were also made from the Special Mission Buildings Fund towards building mission churches at Fazakerley, St. Nathanael, near Liverpool, 25*l*.; Shankhouse, St. Peter, Northumberland, 20*l*.; The Fen, Methwold, Norfolk, 15*l*.; and Chopwell, St. John, near Ebchester, Durham, 50*l*. The following grants were also paid for works completed:—Farnham, St. Lawrence, near Salisbury, 15*l*.; Husthwaite, St. Nicholas, Yorks, 25*l*.; Four Oaks, All Saints, near Sutton Coldfield, 115*l*.; Springfield, St. Stephen, near Wolverhampton, 150*l*.; Johnston, St. Peter, near Milford Haven, 15*l*.; Hamsterley, St. James, Durham, 20*l*.; Thornton Steward, St. Oswald, Yorks, 35*l*.; Wrabness, All Saints, Essex, 40*l*.; Kenfig Hill, St. Theodore, near Bridgend, 50*l*.; Rye Park, St. Cuthbert, Herts, 70*l*.; Grasslot, St. Andrew, Cumberland, 40*l*.; Rushden, St. Mary, Herts, 10*l*.; Orford, St. Margaret, near Warrington, 70*l*.; and Walworth, Pembroke College (Cambridge) Mission, Surrey, 50*l*. In addition to this the sum of 228*l*. was paid towards the repairs of twenty-two churches from trust funds held by the Society. The grants voted at this meeting have nearly exhausted the funds at the disposal of the Committee. Liberal contributions are earnestly invited to enable the Committee to vote substantial grants and to continue the valuable work which this Society has so successfully carried on during the past ninety-one years.

AMENDMENT OF THE LONDON BUILDING ACT.

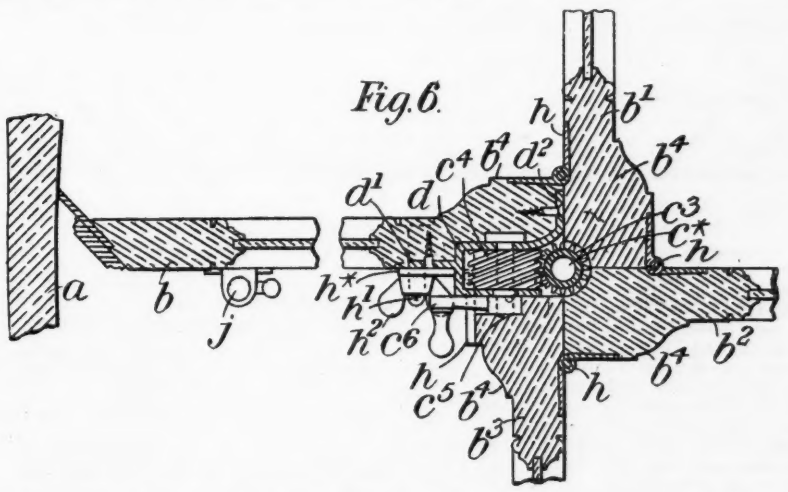
A meeting of engineers and surveyors of metropolitan borough councils was held recently at the London County Council's offices to consider the desirability of adopting some practical working arrangement which would ensure uniformity of practice as between the London County Council and the metropolitan borough councils in regard to the administration of part 7 of the London Building Act, 1894, sects. 82, 83, and 84. Under sect. 84 the borough councils are required to deal with and license wooden structures, but there has been a great deal of misconception as between the London County Council, borough councils, and District Surveyors, as to the definition of the word "structure" when applied to a temporary building, as to the responsibility for supervision, and as to dealing generally with wooden structures and temporary buildings. The view of the Superintending Architect of the London County Council, after a careful retrospect of the various sections and definitions in the Building Act, was that the expression "building" means and includes an erection comprising a cubical space defined by walls, piers, post, columns, or other supports or enclosures, and a roof, whether the erection is wholly enclosed or not, and whether it is fixed on permanent foundations or not, and of whatever material the supports, enclosures, or roof may be composed, and that the expression "structure" means and includes a wall or other erection or construction of whatever kind, not being a building, and of whatever material, and whether attached to a building or not, and that since sect. 84 applies only to wooden "structures," wooden "buildings" cannot properly be dealt with and licensed by borough councils under that section. After consideration, the conference agreed that the borough councils should license:—(1) All structures (whether of wood, iron, or other material, and whether having a roof or not) put up for temporary use on public occasions and processions, not extending over a period of one week, and entirely taken down and removed within a period sufficient for the purpose after the conclusion of the occasion for which they were erected. (2) All wooden structures not having a roof and not being within the prescribed distance or beyond the general line of buildings, and not being additions to existing buildings. (3) All wooden buildings entirely constructed of wood, including the roof and enclosures to such buildings, and comprised within the following limits—(*a*) not exceeding in area 64 sq. ft.; and

(*b*) not exceeding in height 7 ft. in any part measured from the level of the ground to the underside of the eaves or roof plate; and (*c*) distant at least 5 ft. from any street, and from any other building or structure, or from land in a different occupation, unless there be non-perforated wall separating the proposed structure for the whole of its length and height from such other building or structure or such land; and (*d*) not having therein any stove, flue, fireplace, hot-air pipe, hot-water pipe, or other apparatus for warming or ventilating the same; and (*e*) not extending in any part thereof within the prescribed distance from the centre of the roadway of any street or way; and (*f*) not projecting in any part thereof beyond the general line of the buildings in any street or way.

At a conference held at the County Hall on the 14th inst., called by the Superintending Architect of the London County Council "to consider the questions raised in Part V. of the London County Council (General Powers) Bill," there were present representatives of the Councils of the Royal Institute of British Architects, the Surveyors' Institution, the Institution of Mechanical Engineers, the British Fire Prevention Committee, the Concrete Institute, the Institute of Builders, the London Master Builders' Association, and the District Surveyors' Association, when the following resolution was carried, with one dissentient:—"That the scope of the said Bill (Part V.) should be limited to the construction of enclosing, *i.e.*, external and party, walls." The Council of the Institute of Architects had the matter before them at their meeting last Monday, and passed the following resolution:—"That the Council of the Royal Institute of British Architects unanimously endorses the resolution passed at the conference held at the County Hall on the 14th inst., and urges that the draft Bill should be amended accordingly; that a copy of the report of the conference and of this resolution be sent to the Clerk of the London County Council and to the Superintending Architect."

AN IMPROVED REVOLVING DOOR.

Elliott's Moulding and Joinery Company (Newbury) send us the specification and drawings of a very ingeniously contrived revolving door. In the working position of the door, the four (or more) wings of it are solidly bolted together in the centre and form a rigid structure with the doors radiating from the axis. But they are connected by a detachable set of hinges, and the turn of a handle draws back the bolts which hold together the heels, as one may call them, of the doors, and they can then all be folded on each other like a screen, and pushed to one side of the doorway opening so as to leave a clear passage through. One of these doors has been set up in the Welbeck Hotel; and a specimen of one of them will be placed in the next Building Trades Exhibition. The accompanying diagram gives an idea of the putting together of the leaves when the door acts as a revolving door, but to understand the action thoroughly it would be necessary to see the door itself in working order. It is an exceedingly ingenious piece of construction, and has been accepted fully by the London County Council.



Messrs. Elliott's Revolving Door: Plan showing central attachment of doors.

PLANING AND MOULDING MACHINE.

Messrs. F. W. Reynolds & Co. send us a circular describing their "Victor" 12-in. planing, jointing, trying-up, rebating, and moulding machine with hand feed. This is a very strongly-made tool mounted on a cast-iron box section frame, with tables 6 ft. long over all, and extending laterally beyond the edge of the cutter block. One advantage of the arrangement, in addition to the increased table surface, is that rebates up to § in. deep can be worked by the edge of the plane knives. The cutter block is of the improved "skew" type giving a shear cut. It is truly balanced and grooved on all sides so that moulding knives can be used at the same time as the plane knives without removal of the latter. The bearings are of the self-lubricating ring type; and at a small extra cost the machine is supplied with a new design eccentric lever fence with instantaneous canting motion. Besides the work mentioned above, the machine is suitable for tongueing, grooving, squaring-up, cornering, chamfering, stop-chamfering, taper planing, bevel planing, and sundry other operations necessary in wood-working shops.

VENICE EXHIBITION OF THE FINE ARTS.

The British Art Committee appointed for the eighth biennial International Exhibition of Fine Arts, which will be opened in April next, consists of Sir George Frampton, Mr. Frank Brangwyn, and Mr. Grosvenor Thomas. Sir David Salomons has contributed 3,000*l.* towards the purchase of a pavilion for the display of exhibits from Great Britain.

NORTHAMPTON POLYTECHNIC INSTITUTE, CLERKENWELL.

The annual prize distribution and conversazione will be held on Friday and Saturday, February 5 and 6 next. The Earl of Halsbury, Prime Warden of the Saddlers' Company, will distribute the prizes on February 5, and after the prize distribution the new buildings which have been recently erected in the courtyard with funds provided by the London County Council will be formally declared open. These buildings, five stories in height, contain on the upper floors fine lecture-rooms and classrooms, on the ground floor staff-rooms and rooms for the meetings of societies (*e.g.*, the Engineering Society) connected with the Institute, and on the basement floor extensive additions to the workshops and laboratories of the mechanical engineering department. After the above ceremonies the whole of the laboratories, workshops, drawing offices, and studios of the Institute, both in the main building and in the British Horological Institute adjoining (the technical optics department), will be on view in working order. The conversazione of members and students will be held on the following evening, Saturday, February 6, in both buildings.

COWDRAY PARK, SUSSEX.

We understand there is no intention whatever of converting the ruins of Cowdray into a modern residence, the desire of the present owner, Sir Weetman Pearson, being to preserve them in their present beautiful condition as far as it is possible.

THE WIDENING OF PICCADILLY.

The hearing of the important series of compensation cases arising out of the acquisition of premises in Piccadilly for the widening of that thoroughfare at a point adjacent to the Piccadilly Hotel has been begun at the Sessions House, Newington, before Mr. Loveland Loveland, K.C., and a jury. The Westminster City Council is acquiring, under Michael Angelo Taylor's Act, the front portion of the premises Nos. 19 and 20, Piccadilly, with a view to setting back the line of frontage flush with that of the adjoining new building, the Piccadilly Hotel. After the street has been widened, by the demolition of a part of the premises, a new front will be built, and they will be retained by the claimants. The frontage to Piccadilly of the part taken is 26 ft. 10 in., and the return frontage to Air-street about 28 ft., an area of 1,230 sq. ft., and, as the total area at present is 2,582 sq. ft., there will be left in the claimants' possession an area of 1,352 sq. ft. The building element in the case has been the subject of private proceedings before Mr. H. T. Steward (Past-President of the Surveyors' Institution), and the amount of his award will be formally added to the verdict of the jury, whose inquiry is practically limited to the question of the leasehold and trade interests affected by the improvement. Mr. Balfour Browne, K.C., and Mr. Boydell Houghton appear for Messrs. Denman & Co., Ltd., another interest (that of Mr. Burgess) being represented by the same counsel; Sir Edward Clarke, K.C., and Mr. Boydell Houghton appear for Messrs. Cording & Co., Ltd.; and Mr. Freeman, K.C., and Mr. Courthope-Munroe represent the Westminster City Council. The first case taken was that of Messrs. Denman & Co., Ltd., wine merchants, whose claim, as presented in Court, amounted to 63,084*l.* (exclusive of whatever sum Mr. Steward may apportion to them, as before stated, for cost of rebuilding and refitting and for architect's fees). Mr. Burgess, the claimants' managing director, gave evidence as to the serious loss and inconvenience he apprehended from the removal to temporary premises during the alterations, and as to the permanent disability under which the firm would work in the diminished area of the remodelled premises. Mr. Douglas Young, F.S.I., Past-President of the Auctioneers' Institute (Messrs. Douglas Young & Co.), described the building known as Denman House as a fine structure in Portland stone with black granite, of six floors and basement. It was, he said, one of the best sites in London, particularly for the claimants' business. When the premises had been refronted the entrance would be much narrower, and the accommodation not nearly equal to that at present available. His aggregate estimate was 63,084*l.*, to which an addition must be made according to Mr. Steward's award. Mr. B. I'Anson Breach, F.S.I., Vice-President of the Auctioneers' Institute (Messrs. Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.), gave a detailed valuation, amounting to 62,293*l.*, exclusive of the amount to be added for the building element of the case. Mr. Daniel Watney, Past-President of the Surveyors' Institution (Messrs. Daniel Watney & Sons), and Mr. Philip Pilditch also gave valuations in support of the claim. The jury's verdict was for a total award of 38,850*l.*, made up as follows:—Compensation, 35,000*l.*; cost of advertising, stationery, etc., 500*l.*; cost of removals and fitting up temporary premises and adapting furniture, 600*l.*; for trade disturbances, 1,000*l.*; and loss of rental, 1,750*l.*

Law Reports.

ACTION FOR SLANDER OF TITLE.

In the Manchester County Court on Tuesday last week, John Francis Bowman, builder, of Ailsa Craig, Rochdale-road, Blackley, claimed 100*l.* for slander of title from Joseph Bleackley, of Vailinia, Grassendale-park, Liverpool, and from the latter's architect and agent, W. A. Broughton. Mr. Gilbert Jordan was counsel for the plaintiff, and Mr. Ray for the defendants.

Mr. Jordan stated that on August 20, 1896, the defendant Bleackley conveyed to the plaintiff a plot of land on the northern side of Moston-lane. It was bounded on one side by other land owned by Mr. Bleackley, and on the other side by land in the possession of the trustees of the Simpson Memorial. Subsequently the plaintiff submitted to the Corporation plans for the erection of seven houses on the land. These were approved by the Corporation, but not acted upon by the plaintiff. Afterwards the defendants put in a plan for building operations, and by means of this plan calmly dedicated to the public a portion of the land already sold to the plaintiff. They represented that a public street or passage already existed. The result was to save the defendants from making a passage on their own land and to compel the plaintiff to leave one on his.

In reply to the judge, Mr. Ray admitted that the whole of the land was sold by his clients to the plaintiffs, but denied any responsibility for the dedication of the passage in question to the public. Mr. Bleackley deposited plans for the erection of houses on his own land, whereupon he was told he had omitted to put upon

his plan the passage already dedicated to the public on the plan for seven houses put in by the plaintiff. At the request of the Corporation's servant he altered the plan to include the passage.

The Judge: I see what you mean. The cause of the trouble is not your slander to his title, but his own action in misleading the Corporation by means of his own plan, and then not carrying out that original plan.

Mr. Ray: That is so.

John Clayton, Assistant Building Surveyor to the Corporation, asserted that when plans were deposited with the Corporation and were not withdrawn after being approved, they stood good for two years. As the defendants deposited their plan within the two years it was assumed that the passage was dedicated to the public, and must therefore be inserted in the defendants' plan. After two years the plans, if not carried out, became dead.

After hearing evidence,

The judge said that if the plaintiff had any right of action at all it was against the Corporation for assuming that the original plan of the plaintiff would be carried out and the passage dedicated. All that the defendants did was to insert on their plan something which the Corporation stipulated must be put there according to their by-laws. That was not a slander of title, nor did it give a cause of action against the defendants. As to whether the Corporation were justified in doing what they had done he was not then called upon to decide. There would be judgment for the defendants, with costs.—*Manchester Guardian.*

Patents.

APPLICATIONS PUBLISHED.*

27,621 of 1907.—T. Marks, L. Fely, and J. Bakk: Door and like locks.

634 of 1908.—B. S. G. Watts: Fastening devices for doors.

5,222 of 1908.—A. Knapen: Drying and building structures and materials.

7,522 of 1908.—H. Hope & Sons, Ltd., and J. A. Hope: Glazed roofs.

6,255 of 1908.—W. B. Haigh and W. B. Haigh & Co., Ltd.: Lubrication of the cutter spindle bearings of wood-moulding, planing, and like machines.

10,276 of 1908.—J. Fry: Opening and closing apparatus for skylights and the like.

27,196 of 1907.—H. M. Hardy: Method of and means for securing sash-cords, and contructional details connected therewith.

12,150 of 1908.—R. W. Wheelband: Wire-rope ladder scaffolding.

27,620 of 1907.—J. Kern and F. Keilwerth and O. Schurrer: Safety mortise locks.

1,412 of 1908.—C. Vogelsang: Securing device for door locks.

3,261 of 1908.—W. G. Lillington and F. C. Seymour: Window sashes.

4,116 of 1908.—J. Birtwistle: Construction of floors.

10,215 of 1908.—W. Herbst: Reinforced concrete floors, roofs, ceilings, and the like.

27,418 of 1907.—C. V. H. Jenner: Sash or sliding windows

2,118 of 1908.—H. K. Dyson: A bar for reinforcing concrete.

4,184 of 1908.—T. Towler: Window-sash fasteners.

13,812 of 1908.—C. Dean: Locks and latches.

16,123 of 1908.—A. A. Rea and G. H. Rea: Sliding doors.

2,431 of 1908.—L. Schlentheim, F. D. Huntington, and Diespeker, Ltd.: A building block. This relates to a new or improved building block of the type in which a facing plate is secured to a cement or artificial stone block by a bond secured to the facing plate and embedded in the cement or artificial stone. Slabs of stone or tiles of any convenient size, and plain or worked to any desired pattern or ornamentation, are provided with holes or recesses or the like for the reception of bonds of iron or other suitable material, parts of which may be grouted into the said holes or recesses or otherwise attached to the slabs or tiles, leaving the remainder of the said bonds projecting. These bonds may be of any desired form, such, for example, as plates, rods, twisted or indented bars, or the like. In the example, 1 is the stone slab or tile, which may be plain or worked to any desired pattern or ornamentation. The bonds 2 consist of strips of sheet metal bent into U-shape, the ends of the two limbs being bent over into recesses 3, in the edges of the slab or tile, in which recesses they are fixed by grouting or cement. The bonds being affixed to the slab or tile 1, the backing 4 of concrete, cement, or other suitable composition or matrix is attached by moulding as mentioned.

* All these applications are in the stage in which opposition to the grant of patents upon them can be made.

15,946 of 1908.—C. F. Varney: Bars for reinforcing concrete. This relates to certain improvements in bars, rods, or trusses designed for use in the construction of concrete or like cementitious beams, girders, walls, floors, columns, and the like, and the object of the invention is to provide a construction in which there are two or more tension members arranged parallel or at any desired angle to each other, and connected by shear members, adjacent ends of a plurality of the latter being intertwined to hold them together and form the first-mentioned tension members. A main lower tension bar 10 is provided, made up of a plurality of strands intertwined to retain them in engagement with each other. The specific form of intertwining involves the simple twisting of the strands about each other. The main tension bar at its centre is made up of four strands, and three of these branch off to form the shear bars 11, 13, and 14, the fourth strand 15 remaining to form the terminal portion of the main tension bar. The intertwined ends 16 of the strands at the terminal of the upper tension bar may be bent at any desired angle to the main general direction of the tension bar to form a more secure anchorage. All of the strands are preferably of substantially the same length, and, with the shear bars lying parallel and the tension bars lying parallel, all of the upper strands will terminate at the same point. The terminal portion 17 of the single lower strand 15 may be bent at an angle to form an anchorage, or may be secured to the adjacent end of a second reinforcing bar, or may be employed for securing the end of the reinforcing bar in place in any suitable manner.

Fig. 1.

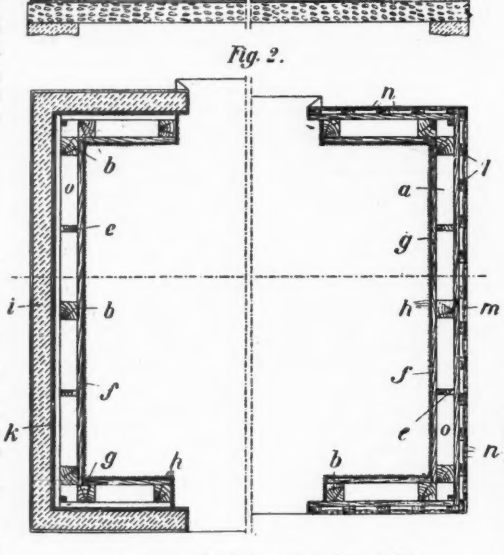
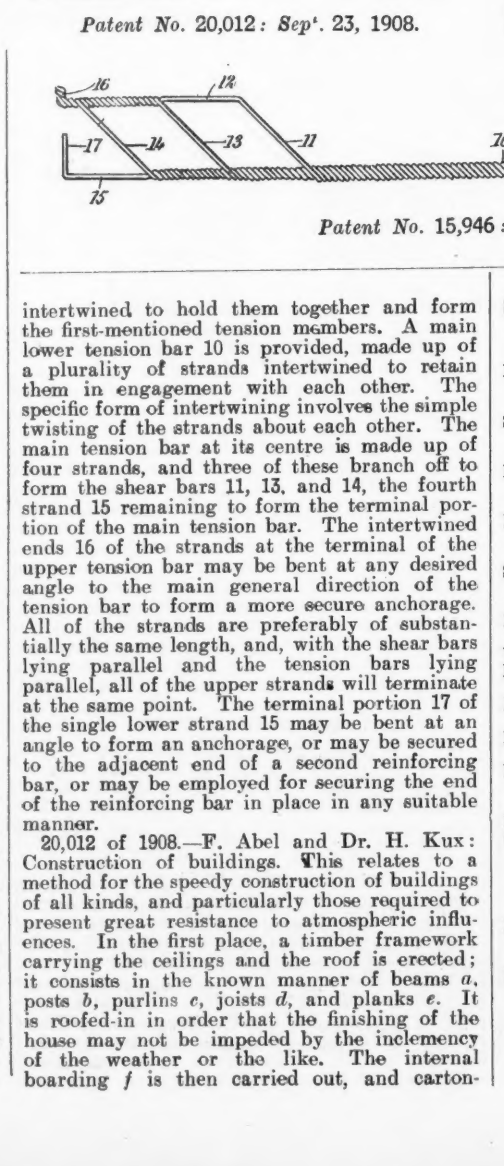
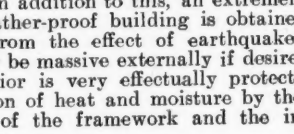


Fig. 2.

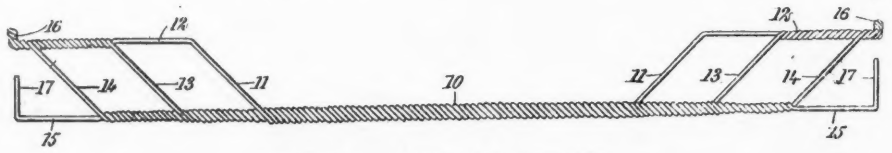


Patent No. 20,012: *Sep*t. 23, 1908.

20,012 of 1908.—F. Abel and Dr. H. Kux: Construction of buildings. This relates to a method for the speedy construction of buildings of all kinds, and particularly those required to present great resistance to atmospheric influences. In the first place, a timber framework carrying the ceilings and the roof is erected; it consists in the known manner of beams *a*, posts *b*, purlins *c*, joists *d*, and planks *e*. It is roofed-in in order that the finishing of the house may not be impeded by the inclemency of the weather or the like. The internal boarding *f* is then carried out, and carton-pierre *g* and woven wire *h* are then arranged over it. While the internal erection is proceeding a stronger surrounding structure *i* appropriate to the circumstances of the case is built up and connected at intervals by means of tie-pins or in any other convenient manner with the lathwork *p* and the beams *a*, posts *b* and *e*, and purlins *c*. The wooden surfaces which come into contact with the masonry are previously impregnated or otherwise appropriately insulated therefrom. If it be desired to omit the connexion between the masonry and the woodwork by means of ties, a covering of carton-pierre *k* (Figs. 1 and 2 left hand) is provided between the containing wall and the lath work, so that the plaster applied to the latter connects the two parts of the structure at the contacting places. In order still further to insulate the interior from the influence of heat, cold, and bad weather, the outer solid masonry may be replaced by another air layer formed by lathwork *l* arranged on the outer boarding *f* of the timber framework and the plaster arranged thereon upon carton-pierre *m* and woven wire *n* in the known manner (Figs. 1 and 2 right-hand side). It is claimed that such a building can be constructed and rendered habitable in an exceedingly short time, with the additional advantage that it is cheaper to build than a structure of the usual kind. In addition to this, an extremely strong and weather-proof building is obtained; it is secure from the effect of earthquake shocks, and may be massive externally if desired, while its interior is very effectually protected from the action of heat and moisture by the hollow part *o* of the framework and the insulating insertions.



Patent No. 2,431: 1908.



Patent No. 15,946: *July* 27, 1908.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 11.—By FLICK & SON (at Laxfield).

Laxfield, Suffolk.—Freehold and copyhold house, blacksmith's shop and 4¾ acres	£335

By THURGOOD & MARTIN

Streatham.—Telford-av., f.g.r. 142*l.*, reversion in 68¼ yrs.	3,200

January 20.—By JOHN BOTT & SONS.

Herne Hill.—59 and 60, Dulwich-rd., u.t. 55¾ yrs., g.r. 12*l.*, y.r. 68*l.*	465
24, Chaucer-rd., u.t. 57 yrs., g.r. 6*l.*, y.r. 33*l.*	245
Brixton.—140, Akerman-rd, u.t. 54½ yrs., g.r. 6*l.*, y.r. 33*l.*	345

By DANIEL & IVERSON.

Shepherd's Bush.—49, Rayleigh-rd., u.t. 60 yrs., g.r. 10*l.*, e.r. 55*l.*	150

By WALTER HALL & SONS.

Hackney.—Orchard-pl., l.g. rents 23*l.*, u.t. 30 yrs., g.r. 2s.	280
Wembley.—Mostyn-av., six freehold plots	390
Fulham.—3 and 4, Lalor-st., u.t. 76 yrs., g.r. 13*l.*, y.r. 69*l.*	605
Bromley-by-Bow.—Botolph-rd., l.g.r. 19*l.*, u.t. 53 yrs., g.r. 6d.	300
Lee.—232, High-rd. (s.), u.t. 53 yrs., g.r. 9*l.* 10s., y.r. 60*l.*	695
Islington.—12, Ann-st., u.t. 27½ yrs., g.r. 5*l.* 10s., y.r. 40*l.*	220

By NEWELL & HAMLYN.

Ealing.—High-st., f.g.r. 50*l.*, reversion in 57 yrs.	1,360
Greenwich.—Vanbrugh-hill, f.g. rents 55*l.* 13s., reversions in 32 to 37 yrs.	1,530
Pelton-rd., f.g. rents 10*l.* 4s., reversion in 60 yrs.	260

By RUSHWORTH & BROWN.

Regent-street.—5, Argyll-pl., and 5, Green Dragon-yard, area 3,500 ft., f., p.	20,200

By DOLMAN & PEARCE (at Camden Town).

Hampstead.—8, 13, and 14, Maitland Park-rd., u.t. 43 yrs., g.r., etc., 20*l.* 10s., y. and e.r. 146*l.* 10s.	1,030
9, Maitland Park-villas, u.t. 43 yrs., g.r., etc., 11*l.* 10s., y.r. 50*l.*	295

RECENT SALES.—*Continued on page* 134.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxviii.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

Competitions.

FEBRUARY 2. — **Leeds.** — WORKHOUSE BLOCK.—The Guardians, being about to proceed with the erection of a new block at the Workhouse, are prepared to receive applications from architects practising in the City of Leeds to be appointed architects for the work. Mr. Jas. H. Ford, Clerk to the Guardians, Poor Law Offices, South Parade, Leeds.

FEBRUARY 20.—**Guildford.**—BRIDGE.—Designs are invited for proposed light footbridge over the River Wey, Guildford, constructed in oak or other materials. All information can be obtained from Mr. C. G. Mason, C.E., Tuns-gate, Guildford.

FEBRUARY 20.—**Penclawdd.**—CHURCH.—Bethel Independent Church, Penclawdd, is prepared to receive plans for the erection of a new chapel to contain 800 seatings. The approximate cost of chapel, including heating and acetylene lighting apparatuses, to be 3,000*l.* A premium of 5*l.* 5s. will be awarded the architect whose plan the committee may select. Plans to be deposited with the Secretary, Mr. John Rees, Penlan, Penclawdd, S.O.

MARCH 1. — **Torrington.** — MEMORIAL CROSS.—The Committee of Torrington and District Rolle Memorial invite designs for a memorial cross (preferably of granite), to be erected on a site in the Churchyard, Torrington. Cost, inclusive of erection, etc., not to exceed 100*l.* The Committee will pay 2*l.* 2s. for the selected design, but no other charge or expense. Particulars from Mr. George M. Doe, Town Clerk, Great Torrington.

MARCH 31. — **Middlesbrough.** — NEW LIBRARY.—The Free Library Committee invite plans for proposed new Library to be erected in Dunning-road and Grange-road, East Middlesbrough. Premiums of 50*l.*, 30*l.*, and 20*l.* Conditions, with plan of site, may be obtained on application to Mr. Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit, 2*l.* 2s. For further particulars see advertisement in our issue of December 26.

Contracts.

BUILDING.

FEBRUARY 1.—**Leeds.**—VERANDAHS.—The Guardians invite tenders for the building of wood and glass verandahs at the imbecile Wards (sect. 4), Beckett-street, Leeds. Apply to Messrs. Winn & Sons, 84, Albion-street, Leeds.

FEBRUARY 2. — **Brixham, etc.** — STABLES.—Great Western Railway Directors invite tenders for the erection of stables at Brixham, Tavistock, and Princetown. Plans, etc., may be seen, and forms of tender, etc., obtained, at the office of the Engineer at Plymouth (North-road) Station.

FEBRUARY 2. — **Haddo House Estates, Aberdeen.**—BUILDING WORKS.—Estimates are wanted for the mason, carpenter, and slater works of the following cottages:—(1) Loanhead of Savoch (Mr. William Johnstone), double cottage; (2) Skilmafilly (Mr. William Mackie), double cottage; (3) Wardford (Mr. David Davidson), double cottage; (4) Crichie (Mr. John Strachan), single cottage; (5) Stoneyfield (Mr. John Hay), single cottage. Plans and specifications may be seen at the farms and at the Estate Office.

FEBRUARY 2. — **Penywern.** — HOUSES. — Merthyr Tydfil Corporation invite tenders for the erection of sixty-eight houses at Penywern, Dowlais. Plans, etc., may be seen, and forms of tender obtained, at the office of the Borough Surveyor, Town Hall, Merthyr Tydfil.

FEBRUARY 2.—**Sutton-in-Ashfield.**—FOUNDATIONS.—Sutton-in-Ashfield U.D.C. invite tenders for the foundations to retort house, culverting of stream, boundary, etc. Names and addresses to Messrs. Corbet, Woodall, and Son, Palace-chambers, Bridge-street, Westminster, S.W., together with a deposit of 3*l.* 3s. for copies of specification, etc.

FEBRUARY 3. — **Belfast.** — CEILING, ETC. — Erecting new wood ceiling, painting, and renovating the Great Victoria-street Presbyterian Church. Schedule of quantities and conditions of tender may be obtained from Mr S. C. Hunter, Scottish Provident Buildings. Plans, etc., can be seen at office of Messrs. Young & Mackenzie, Scottish Provident Buildings, Belfast.

FEBRUARY 3.—**Bradford.**—ALTERATIONS TO COTTAGES.—The Bradford Corporation invite tenders for work required in the alterations to cottages, Broad-lane. Drawings, etc., may be seen, and bills of quantities and forms of tender obtained, on application to the City Architect, Whitaker-buildings, Brewery-street, Bradford.

FEBRUARY 3. — **East Stonehouse, Devon.** — ALTERATIONS.—Alterations to premises, No. 1, St. Mary-street; No. 1, Clarence-place; and the Workhouse premises, East Stonehouse, Devon. Names and addresses to the architects, Messrs. Thornely & Rooke, No. 11, The Crescent, Plymouth.

FEBRUARY 3.—**Elgin.**—ADDITIONS, ETC.—Mason, carpenter, slater, plumber, plaster, and painter works of additions and repairs at No. 293, High-street, Elgin. The plans, etc., may be seen with Mr. John Wittet, architect, Elgin.

FEBRUARY 3. — **Llwynypia.**—ALTERATIONS.—Alterations to the Church of Dewi Sant, in the Parish of Llwynypia (Trealaw Station), for the Rev. D. T. R. James, B.A., and Committee. Plans, etc., can be seen at the church. Bills of quantities can be obtained on application to Mr. John W. Rodger, architect, 14, High-street, Cardiff.

FEBRUARY 3. — **Macclesfield.** — SANITARY CONVENIENCE. — The Corporation of Macclesfield invite tenders from local builders and contractors for the erection of a sanitary convenience in Samuel-street. Forms of tender, etc., can be had on application to Mr. Chas. W. Stubbs, Borough Surveyor, Town Hall. Applications to be accompanied by a deposit of 1*l.* 1s.

FEBRUARY 3. — **South Dublin.** — COTTAGES.—South Dublin R.D.C. invite tenders for building seventeen labourers' cottages, under four contracts. Plans, etc., may be inspected, and tender forms obtained, at the offices of the R.D.C.

FEBRUARY 3.—**Sunderland.**—PROPOSED ADDITIONS TO OUT-PATIENTS' DEPARTMENT, SUNDERLAND INFIRMARY.—Plans, etc., can be seen at the offices of Mr. Geo. T. Brown, F.R.I.B.A., architect, 51, Fawcett-street, Sunderland, and bills of quantities can be obtained on payment of a deposit of 10s. 6d.

FEBRUARY 4.—**Aberdare.**—VILLA, ETC.—Erection of a villa, etc., at Abernant-road, Aberdare, for Mr. H. Powell, Danygraig, Aberdare. Plans, etc., may be seen at office of Mr. T. Roderick, architect, Clifton-street, Aberdare.

FEBRUARY 4.—**Brynmawr.**—INN.—Rebuilding the "Old Castle Inn," Brynmawr, Mon., for Messrs. A. Buchan & Co., Rhymney Brewery, Rhymney. Plans, etc., may be seen at office of Mr. T. Roderick, architect, Clifton-street, Aberdare, where bills of quantities may be obtained.

FEBRUARY 5.—**Abercynon.**—HOUSE.—Erection of a detached house at Abercynon for Mr. D. Evans. Plans, etc., may be seen at the office of Mr. William Dowdeswell, architect, Treharris, and also at Greenfield House, Abercynon.

FEBRUARY 6.—**Bitterne.**—DWELLINGS.—Erection of ten model artisans' dwellings at Bitterne. Names to Mr. W. Guy Prendergast, architect, Sholing, Hants, together with a deposit of 1*l.* 1s.

FEBRUARY 6. — **Bude.**—SUNDAY-SCHOOL BUILDINGS.—Building a new block of Sunday-school buildings and caretaker's house adjoining the Wesleyan Church at Bude, North Cornwall. The drawings, etc., may be seen at the office of Mr. Ernest Wise, M.S.A., architect, Launceston, by appointment.

FEBRUARY 6.—**Cardiff.**—CHAPEL, ETC.—Erection of a Baptist Chapel and School at Holy Head. Particulars and bills of quantities from Mr. W. Beddoe Rees, architect, 3, Dumfries-place, Cardiff, on deposit of 3*l.* 3s.

* FEBRUARY 6.—**Heathfield (Sussex).**—ADDITIONS TO SCHOOL.—The East Sussex Education Committee invite tenders for erection of new classroom, new offices, etc., at Maynards Green Public Elementary School, in Parish of Heathfield. See advertisement in this issue for further particulars.

FEBRUARY 6. — **Nenagh.** — SCHOOL.—Erection and completion of a new National School, to accommodate 520 children, at the Convent of Mercy, Nenagh, Co. Tipperary, in accordance with plans, etc., prepared by Messrs. J. O. Moynan, M.A., M.Inst.C.E., and R. P. Gill, A.M.Inst.C.E., architects. Copies of plans, etc., may be inspected at the office of the architects and at the office of Mr. S. H. Bolton, quantity surveyor, 34, Westland-row, Dublin. Bills of quantities may be had on application to the Surveyor on a deposit of 3*l.*

FEBRUARY 6.—**Treorky.**—CHAPEL WORKS.—Large extensions at Noddfa Chapel, Treorky. Plans, etc., can be seen at the offices of Mr. Jacob Rees, architect, Pentre.

FEBRUARY 8. — **Dublin.**—PLASTERING.—The Estates and Finance Committee of the Corporation of Dublin invite tenders for the complete restoration of the ornamental plaster ceiling, cove, and cornice of the Council Chamber of the City Hall, and for the necessary repairs to the plaster of the walls of the Council Chamber. Conditions of contract can be obtained on application to the City Architect, at his office, Municipal Buildings, Cork-hill, Dublin.

FEBRUARY 8. — **Gors, Llandegfan.** — RESIDENCE.—Erection of a private residence situate at Gors, Llandegfan. Plans, etc., may be inspected at office of Mr. Jos. Owen, F.R.I.B.A., architect and surveyor, Menai Bridge.

FEBRUARY 8.—**Ogmore Vale.**—HALL.—Erection and completion of a large hall, to accommodate about 1,000, a lesser hall, billiard-room, and institute, together with reading-rooms and library, at Ogmore Vale. Plans, etc., may be seen at the present Library, Commercial-street, Ogmore Vale, or at office of Mr. W. Beddoe Rees, architect, 3, Dumfries-place, Cardiff, where bills of quantities may also be obtained on deposit of 3*l.* 3s.

FEBRUARY 10.—**Manningham.**—STORE.—Works required in the erection of a store in Westfield-road, Manningham, for the City of Bradford Co-operative Society, Ltd. Plans to be seen, and quantities obtained, at office of Mr. William Rycroft, architect, Bank-buildings, Manchester-road, Bradford.

FEBRUARY 11. — **Bardsea.** — POLICE-STATION.—The Standing Joint Committee of the Lancashire C.C. invite tenders for the erection of a new police-station, at Bardsea, near Ulverston. The plans may be seen, and bills of quantities obtained, by payment of a deposit of 2*l.*, at the office of the architect, Mr. Henry Littler, 16, Ribblesdale-place, Preston.

FEBRUARY 11. — **Bridlington.** — LAVATORIES.—The Corporation invite tenders for the demolition of the existing lavatories, and the erection of new lavatories, in accordance with plans, etc., which may be seen at the Borough Surveyor's Office, Town Hall.

FEBRUARY 11. — **Bridlington.**—RETAINING WALL.—The Corporation invite tenders for the building of a retaining wall, with palisading thereon, adjoining Marine Drive, and also for the erection of dwarf wall and palisading, to surround the proposed Pembroke Gardens, in accordance with plans, etc., which may be seen at the office of Mr. E. R. Matthews, A.M.Inst.C.E., Borough Surveyor, Town Hall, Bridlington.

FEBRUARY 11. — **Margate.**—LAVATORIES.—The date for the delivery of tenders for the above is extended to one o'clock p.m. on February 11.

FEBRUARY 11.—**Trefdraeth.**—SCHOOL.—Erection of a new Council school at Trefdraeth, for the Anglesey Education Committee. Plans, etc., may be inspected at Bodra Golwyn Farm, Trefdraeth, and at office of Mr. Jos. Owen, F.R.I.B.A., County Architect, Menai Bridge.

* FEBRUARY 15. — **Portsmouth.**—SOLDIERS' QUARTERS.—The War Department invite tenders for erection of 16A and 10B married soldiers' quarters at Clarence Barracks, Portsmouth. See advertisement in this issue for further particulars.

FEBRUARY 16.—**Athy.**—POST-OFFICE.—The Board of Public Works invite tenders for the erection and completion of a new Crown Post-office at Athy. The plans, etc., can be seen at office of Mr. H. Williams, Secretary, Office of Public Works, Dublin, and at the Post-office, Athy. Forms of tender and bills of quantities will be supplied on deposit of 1*l.*

FEBRUARY 16.—**Durham.**—New Council schools at North Brancepeth, Medomsley Edge, and New Brancepeth; enlargement of Langley Park Infants' Council School; alterations and improvements at Ouston, Wingate Infants', Hawthorn, Rowlands Gill, and West Stanley Infants' Council Schools. Plans, etc., can be seen, and bills of quantities obtained, as follows:—(1) For schools at North Brancepeth (Langley Moor) and New Brancepeth (Sleetburn), and alterations at Ouston, Wingate, Hawthorn, Rowlands Gill, and West Stanley, at the office of Mr. F. E. Coates, Shire Hall, Durham; (2) for schools at Medomsley Edge, at the office of Mr. J. J. Eltringham, architect, Blackhill; (3) for enlargement of Langley Park Infants' Council School, at the office of Mr. W. Rushworth, Shire Hall, Durham.

* FEBRUARY 17.—**Manchester.**—GOODS OFFICE, ETC.—The Midland Railway Company invite tenders for additional goods office, etc., at Ancoats Goods Depôt, Manchester. See advertisement in this issue for further particulars.

* FEBRUARY 23.—**Leyton.**—SCHOOLS.—The Leyton U.D.C. Education Committee invite tenders for erection of Canterbury-road Council Schools, Leyton. See advertisement in this issue for further particulars.

NO DATE.—**Birstal.**—BUILDINGS.—Taking down of Popeley House, Birstal, and the erection of out-buildings. Names to the architects, Messrs. Joseph F. Walsh, F.S.I., & Graham Nicholas, F.R.I.B.A., architects, Museum-chambers, Halifax.

NO DATE.—**Folkestone.**—NEW WARDS, ETC.—The Committee of the Victoria Hospital, Folkestone, invite tenders from contractors (within the Parliamentary Borough only) for the erection of new wards and extension of out-patients' department. Copies of the quantities may be obtained (on payment of 1*l.* 1s.) on application to the quantity surveyor, Mr. H. J. Moody, F.S.I., 10, Quested-villas, Surrenden-road, Folkestone.

NO DATE — **Leeds.** — HOUSES.—Separate works required in the erection of two houses and alterations to premises, Hyde Park-road, Leeds. Names (stating trade) to Mr. Fred Mitchell, architect and surveyor, 9, Upper Fountaine-street, Albion-street, Leeds, at once.

NO DATE.—**Skinburness.**—Two HOUSES.—Tenders wanted from all trades. Apply Mr. Hodgkinson, architect, Carlisle.

NO DATE. — **Tyersal.** — SLATER'S, ETC., WORK.—Slater's, plumber's, and plasterer's work required for twenty-three houses, Akeroyd Park, Dick-lane, Tyersal. Apply Mr. I. F. Akeroyd, 31, Springfield-crescent, Lidget Green, or on the job.

NO DATE. — **West Bowling.** — ALTERATIONS.—Tenders wanted for alteration of four privies into water-closets. Plans and specifications can be seen at 93, Newton-street, West Bowling.

NO DATE. — **Whitley Bay.** — BUILDING, ETC.—Tenders required for building and alteration of Redcar House, Whitley Bay. Plans, etc., may be seen on application at 51, Percy-road, Whitley Bay.

ENGINEERING, IRON, AND STEEL.

JANUARY 30.—**Edinburgh.**—BOREHOLE.—Edinburgh Corporation invite tenders for sinking a trial borehole at their new Slaughter Houses and Cattle Markets, Gorgie. Specification, etc., can be obtained on applying to Mr. J. Walker Smith, Burgh Engineer, at his office.

FEBRUARY 1. — **Macclesfield.**—HEATING.—Macclesfield Guardians invite tenders for providing a system of heating, and also a hot-water service for domestic purposes, at the infirm wards of the Workhouse. Plan, etc., can be seen on application to Messrs. Whittaker & Bradburn, architects, 19, King Edward-street, Macclesfield.

FEBRUARY 2. — **Skipton.**—BOILER.—Skipton U.D.C. invite tenders for one new Lancashire steam boiler, 20 ft. by 7 ft. Full particulars may be obtained from Mr. J. H. Woodward, Manager, Gasworks, Skipton.

FEBRUARY 3.—**Stourbridge.**—COLD STORAGE PLANT.—The Guardians invite tenders (1) for a small self-contained steam refrigerating plant for cold storage on the C O2 or cold-air system; (2) for a small secondhand ditto. Specification and plan can be seen at the Workhouse, Wordsley.

FEBRUARY 4.—**London.**—RAILS, ETC.—The Directors of His Highness the Nizam's Guaranteed State Railways Company, Ltd., invite tenders for the supply of 550 steel rails, in lengths of 39 ft. 6 in. and 39 ft.; 600 steel fish-plates for the above, as per specification to be obtained at the Company's Offices for the sum of 2s. 6d., which amount will not be returned. Mr. H. Rendel, Secretary, offices of the Company, 268, Winchester House, 50, Old Broad-street, London, E.C.

FEBRUARY 5. — **Skipton.** — EMBANKMENT WORKS.—Repairs and renewals to the embankments, etc., of the long and round dams, Castle Woods, Skipton, for Lord Hothfield and the English Sewing Cotton Company Ltd. Plans may be seen, and bills of quantities obtained, on application at offices of Mr. James Hartley, architect, Skipton.

FEBRUARY 8.—**Dublin.**—WARMING AND VENTILATING.—The Estates and Finance Committee of the Dublin Corporation invite schemes and tenders for the warming and ventilating of the Council Chamber, City Hall, on the "Plenum" system. A plan and section of the Council Chamber, and a copy of the conditions of contract, can be had on application to the City Architect, at his office, Municipal Buildings, Cork-hill, Dublin.

FEBRUARY 10. — **York.** — ROOFING.—North-Eastern Railway Directors invite tenders for platform roofing at the south end, York Passenger Station. Plans, etc., may be seen, and quantities, etc., obtained, upon application to Mr. William Bell, the Company's Architect, at York. Quantities supplied on personal application.

FEBRUARY 19.—**Headingley, Leeds.**—FILTER-BEDS.—Leeds Corporation Waterworks Committee invite tenders for the construction, completion, and maintenance of six new filter-beds, etc., being the second section of the new filter-beds at Headingley, Leeds. Copies of the conditions, etc., may be obtained at the office of the Waterworks Engineer, Municipal-buildings, Leeds, on payment of a deposit of 1*l*.

✱ MARCH 4.—**Norwich.**—HEATING.—The City Committee of Norwich invite tenders for heating the Guildhall and Municipal Offices. See advertisement in this issue for further particulars.

MARCH 13.—**Middlesbrough.**—BRIDGE.—Middlesbrough Corporation invite tenders for the construction of a transporter bridge over the River Tees at Middlesbrough. The specification, etc., may be seen between the hours of ten and four o'clock at office of Mr. Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Persons desirous of tendering will be supplied with a set of plans and other documents on making a deposit of 20*l*.

NO DATE.—**York.**—PILES, ETC.—Tenders for supplying all necessary tackle and driving No. 39 reinforced concrete piles, 14 in. square 40 ft. long, on two sites about one mile apart. Apply Mr. Moss, contractor, Loughborough.

MISCELLANEOUS.

FEBRUARY 1. — **Birkenhead.** — HORSES, ETC.—The Corporation of Birkenhead invite tenders for supplying any horses and drivers that may be required for hauling the Corporation water-carts. Specifications may be seen, and further information and forms of tender obtained, at the office of Mr. Charles Brownridge, M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Birkenhead.

FEBRUARY 1. — **Northwich.** — SCAVENGING.—The U.D.C. of Northwich invite tenders for the removal and disposal of house refuse and nightsoil. Form of contract and forms of tender on application at the Council Offices, Northwich.

FEBRUARY 1. — **Prestwich.** — FURNISHING BOOTH HALL INFIRMARY.—The Guardians of the Poor invite tenders for furnishing the operating theatre at their new Infirmary, Charlestown-road, Blackley, Manchester. Particulars may be obtained at the Infirmary on application to Mr. A. H. Measures, the Steward.

✱ FEBRUARY 3.—**London.**—TIMBER AND BUILDERS' MATERIALS.—The Metropolitan Asylums Board invite tenders for supply of timber and builders' materials. See advertisement in this issue for further particulars.

FEBRUARY 3.—**Northolt, Uxbridge.**—FENCING.—Uxbridge R.D.C. invite tenders for providing and fixing about 111 lin. yds. of post and rail fencing along the water course in Northolt Village. Specification may be obtained at office of Mr. Edmund Birks, Surveyor to the Council, Town Hall, Uxbridge.

FEBRUARY 3. — **Swansea.** — SCAVENGING.—Swansea R.D.C. invite tenders for the removal of refuse, cleansing of earth closets, etc. Forms of tenders, etc., may be obtained from Mr. Edward Harris (solicitor), Clerk, District Council Offices, Alexandra-road, Swansea.

FEBRUARY 4.—**Blaydon.**—SCAVENGING.—The U.D.C. invite tenders for the removal and disposal of contents of ashpits, house refuse, etc., at Rowland's Gill, Smailes Estate, and Lintzford. Specification, etc., may be obtained from Mr. Robert Biggins, Sanitary Inspector, at the offices of the Council, Blaydon-on-Tyne.

FEBRUARY 4. — **Lambeth.** — HOUSE REFUSE. — Lambeth B.C. invite tenders for the clearance and removal of house refuse from the houses in the Herne Hill, Tulse Hill, and Norwood Wards. Specification, etc., may be obtained from Mr. Henry Edwards, C.E., Borough Engineer, Town Hall, Brixton-hill, S.W., on receipt of a stamped addressed foolscap envelope.

FEBRUARY 4. — **Weobley.** — HAULING. — Weobley R.D.C. invite tenders for hauling materials for the roads in their district. Forms and particulars can be obtained from the Surveyor, Mr. F. Gwillim, Weobley, S.O.

FEBRUARY 8. — **Downham.** — TEAM LABOUR.—Downham R.D.C. invite tenders for team labour for the year ending March 31, 1910. Forms of tender can be obtained of Mr. J. S. Parrott, District Surveyor, Downham Market.

FEBRUARY 8. — **Dublin.** — FURNITURE.—The Estates and Finance Committee of the Corporation of Dublin invite tenders for repairing, upholstering, etc., the seats and other furniture of the Council Chamber in the City Hall, and for supplying certain new furniture in accordance with the drawings, etc., which can be seen at the office of the City Architect, Municipal Buildings, Cork-hill, Dublin.

FEBRUARY 8. — **Hanwell.** — FENCING. — Hanwell U.D.C. invite tenders for the supply of about 1,100 yds. of wrought-iron fencing. Particulars can be obtained on application to Mr. Sidney W. Barnes, A.M.Inst.C.E., the Surveyor.

FEBRUARY 9. — **Southampton.** — MOTOR-CAR.—The Corporation invite tenders from local tradesmen for the supply of a new four-seated motor-car. Every tender must be accompanied by the Borough Treasurer's receipt for a deposit of 5*l*. (Bank of England note).

FEBRUARY 9. — **Meriden.** — CARTAGE. — Meriden R.D.C. invite tenders for the cartage of stone. Form may be obtained at office of Mr. A. W. Liggins, Clerk, 11, Priory-street, Coventry.

FEBRUARY 10.—**London.**—SCAVENGING.—The Crown Estate Paving Commissioners invite tenders for the removal of dirt, dust, cinders, ashes, etc., from the houses within the district in the Regent's Park under their jurisdiction for a period of three years. Printed particulars of contract, with form of tender, can be obtained between the hours of 9 and 10 a.m. at the Lodge, Park-square West, Regent's Park.

✱ FEBRUARY 10. — **Regent's Park.** — REMOVAL OF DIRT, DUST, ETC.—The Crown Estate Paving Commissioners invite tenders for removal of dirt, dust, cinders, ashes etc., from houses in the district in Regent's Park. See advertisement in this issue for further particulars.

FEBRUARY 16. — **Barrow-in-Furness.**—CARTING.—The Corporation invite tenders for carting and for shunting coal wagons required to be done at their Gasworks. Further particulars and forms of tender may be obtained at the office of the Manager of the Gas and Water Works.

FEBRUARY 16.—**Halifax.**—CARTING.—The Gasworks Committee of the Halifax Corporation invite tenders for the carting work. Forms of tender may be obtained on application to Mr. J. Wilkinson, F.C.S., Engineer, Gasworks, Halifax.

FEBRUARY 17. — **Houghton-le-Spring.**—SCAVENGING.—The R.D.C. of Houghton-le-Spring invite tenders for the cleansing of earth closets, privies, and ashpits, and removing and depositing ashes, night soil, and house refuse. Full particulars of the places included in the said divisions, together with forms of tender, etc., may be had on application to Mr. Robt. B. Marley, Clerk to the said District Council, R.D.C. Offices, Houghton-le-Spring, S.O.; or to Mr. W. Morley, Inspector of Nuisances, Sunderland-street, Houghton-le-Spring, S.O.

APRIL 15. — **Shanghai.** — WAGON. — Shanghai Municipal Council invite tenders for the supply of a petrol motor fire-hose wagon. Specification and particulars may be obtained upon application to Messrs. John Pook & Co., 63, Leadenhall-street, London.

NO DATE. — **Wisteston.**—PULLING DOWN.—Pulling down Wisteston Chapel. Mr. A. Leslie Tompson, Marden.

PAINTING, etc.

FEBRUARY 2. — **Prince Rock.** — PAINTING. — The Managers of Hele's Charity invite tenders for painting all exterior wood and iron works of the Almshouses at Prince Rock, known as Hele's-terrace. Specifications may be obtained between the hours of 10 a.m. and 4 p.m. at the Clerk's Office. Mr. W. Adams, Clerk to the Managers, 13, Princess-square, Plymouth.

FEBRUARY 2. — **Sunderland.**—PAINTING.—The Corporation of Sunderland invite tenders for the inside painting, etc., of the Art Gallery, Borough-road. Specification, etc., may be obtained at the Borough Surveyor's Office, Town Hall.

FEBRUARY 3.—**Bridlington.** PAINTING OF SEATS.—The Property Committee invite tenders for the painting of a large number of seats on the sea front and in the Public Gardens, in accordance with the specification, which may be seen at the Borough Surveyor's Office, Town Hall, during office hours.

FEBRUARY 10. — **Warrington.** — PAINTING.—The Committee of Visitors, Lancashire County Asylum, Winwick, Warrington, invite tenders for painting part of the outside wood and iron work at Winwick Asylum. Forms can be obtained from Mr. Henry Ellis, Clerk and Steward.

ROADS, SANITARY, AND WATER WORKS.

FEBRUARY 1.—**Ormesby.**—MARKET PLACE IMPROVEMENTS.—Ormesby U.D.C. invite tenders for levelling and covering the eastern and western portions of the Market Place, North Ormesby, with tar macadam, and for kerbing and channelling. Plans, etc., can be seen at the Council Offices, High-street, North Ormesby, on application to Mr. W. G. Harrison, the Surveyor.

FEBRUARY 1. — **Sevenoaks.** — ROAD WORKS.—The U.D.C. of Sevenoaks invite tenders for the levelling, metalling, kerbing, tar paving, footpaths, channelling, and making good of St. James's and St. George's roads, Sevenoaks. Plans, etc., may be inspected, forms of tender, etc., obtained, at the offices of Mr. S. Towlson, A.M.Inst.C.E., Surveyor to the Council, upon payment of a cash deposit of 5*l*.

FEBRUARY 2.—**Banchory-Devenick Estate.**—DRAINS.—Contractors wanted to cut about 5,000 yds. agricultural drains on the above estate. Mr. Mutch, Forester's Cottage, Banchory-Devenick, will point out the ground, and offers will be received by Mr. Robert Brown, Estate Office, Banchory-Devenick.

FEBRUARY 2. — **Epsom.** — ROAD IMPROVEMENTS.—Epsom R.D.C. invite tenders for the making-up of Frederick-road, Cheam. A plan, etc., may be seen at the office of the Surveyor of Highways, Mr. T. E. Ware, Waterloo-road, Epsom, where forms may be obtained.

FEBRUARY 2.—**Hemel Hempsted.**—NEW BORE HOLE.—The B.C. invite tenders for a boring at the Waterworks Pumping Station, Marlowes, Hemel Hempsted, Herts. Plans, etc., may be obtained at the office of Mr. Walter R. Locke, Corporation Waterworks Engineer, Town Hall, Hemel Hempsted, on payment of a deposit of 5*l*.

FEBRUARY 2.—**Penyrheol and Caerphilly.**—SEWERS.—Caerphilly U.D.C. invite tenders for the following works:—(1) Penyrheol—Constructing about 150 yds. of 9-in. and 12-in. sewer, with contingent works, at Beddan-road, Penyrheol; (2) Caerphilly—Constructing about 35 yds. of 6-in. and 9-in. sewer connexions at Bedwas-road, Caerphilly. Plans, etc., may be seen, and form of tender obtained, from Mr. Alfred O. Harpur, Surveyor, Council Offices, Caerphilly.

FEBRUARY 2.—**Stockton**—PRIVATE STREET IMPROVEMENT WORKS.—The R.D.C. invite tenders for the levelling, paving, channelling, and making good of five back streets connected with Myrtle-road, in the Parish of Preston-on-Tees. Full particulars and forms of tender can be obtained on application to the Council's Surveyor, Mr. John Rodham, Finkle-street, Stockton-on-Tees.

FEBRUARY 2.—**Taunton.**—CONSTRUCTION OF 12-IN. STONEWARE PIPE SEWER.—The T.C. invite tenders for the construction of about 780 lin. yds. of 12-in. pipe sewer. Plans may be seen, and specification, etc., obtained, from Mr. D. Edwards, A.M.Inst.C.E., Borough Engineer and Surveyor, Municipal Buildings, Taunton.

FEBRUARY 3.—**Bacup.**—STREET WORKS.—The Corporation of Bacup invite tenders for the works required for the reconstruction of Market-street and Newchurch-road, two and a half miles in length. Specification, etc., may be had on application to Mr. W. H. Elce, A.M.Inst.C.E., Borough Engineer, Bacup.

FEBRUARY 3. — **Oldham.** — PAVING, ETC.—Oldham Surveyor's Committee invite tenders for paving, flagging, and completing of streets. Plans, etc., can be seen, and quantities, etc., obtained, at the office of the Borough Surveyor.

FEBRUARY 3.—**Rathdown.**—DRAINAGE, ETC.—Rathdown No. 1 R.D.C. invite tenders for (1) the drainage and filling in of a dyke near the labourers' cottages at Dean's Grange; (2) the building of two walls. Specifications prepared by Mr. R. M. Butler, A.M.Inst.C.E.I., can be seen at the Clerk's Office, Loughlinstown.

FEBRUARY 3. — **Yiewsley.** — DRAINS. — Uxbridge R.D.C. invite tenders for the construction of storm-water drains in Otter Dock-road, Yiewsley. Drawing, etc., may be obtained at office of Mr. Edmund Birks, Surveyor to the Council, Town Hall, Uxbridge.

FEBRUARY 3.—**York.**—STREET WORKS.—The Corporation of York invite tenders for the sewering, levelling, paving, metalling, channelling, etc., of all private streets required to be made up within the City of York during a period of twelve months. A specification, etc., may be obtained on application at the City Engineer's Office, Guildhall, York. 1*l*. 1s. to be deposited for specification and schedule of offices.

FEBRUARY 4. — **Newtown-by-Chester.** — STREET WORKS.—The R.D.C. of Chester invite tenders for the making of West-street and back passages in the Parish of Newtown-by-Chester, in accordance with the plans, etc., prepared by Mr. C. J. Owen, Surveyor. The plans, etc., and all other particulars may be obtained on application to the said Surveyor, at his office, Dee Banks, Chester.

FEBRUARY 4.—**Swansea.**—SEWERAGE, MORRISTON AND CWMBWRLA.—The Corporation invite tenders for the construction of about 550 yds. of pipe sewers with junctions, manholes, etc., at Morriston. Drawings, etc., may be seen at the office of Mr. R. H. Wyrill, Borough Engineer, from whom form of tender, etc., can be obtained on payment of 1*l*. 1s.

FEBRUARY 6. — **Dartford.**—ROAD WORKS.—Shaping out roads, about 360 yds. run and kerbing same, also for laying about 360 yds. run of 9-in. sewer, etc. Plans, etc., can be seen at the offices of Messrs. Tait & Hobbs, architects, surveyors, and engineers, Lowfield-street, Dartford, and quantities obtained upon payment of 2*l*. 2s.

FEBRUARY 8. — **Corbridge.** — WATER SUPPLY. — Hexham R.D.C. invite tenders for the construction of covered service reservoirs and works connected therewith to supplement the present works for the Corbridge water supply. Plans, etc., may be seen, and quantities, etc., obtained, on application to the Engineer, Mr. J. E. Parker, A.M.Inst.C.E., Post-office-chambers, Newcastle-on-Tyne, on depositing 1*l*. 1s.

FEBRUARY 8. — **Fishguard.** — SEWER.—Fishguard U.D.C. invite tenders for construction of an outfall sewer. Plans, etc., can be seen at the District Council Offices, Fishguard, on application to Mr. D. J. Wilcox, the Surveyor to the Council. Copies of abridged specifications, etc., can be obtained from the Surveyor for cheque or postal order for 1*l*. 1s.

FEBRUARY 8. — **Glanton.**—LAYING WATER PIPES.—The R.D.C. of Alnwick require tenders for providing and laying 738 yds. of 4-in. cast-iron water pipes and fittings at Glanton. The plan, etc., may be seen at the office of the Clerk, Mr. H. W. Walton, Alnwick.

✱ FEBRUARY 8.—**Herne Hill.**—ROAD-MAKING.—The Camberwell B.C. invite tenders for kerbing, channel-

ling, foundation for asphalt paving, roadwork, etc., Frankfurt-road, Herne Hill. See advertisement in this issue for further particulars.

FEBRUARY 8. — **Kent.** — TAR PAVING. — The Kent Education Committee invite tenders for the laying, when and where required, of Kentish rag tar paving at Council schools, also for carrying out any repairs to tar paving. Copies of specification, etc., will be sent on application to Mr. Fras. W. Crook, Secretary, Caxton House, Westminster, S.W., on payment of a deposit of 1*l.*

FEBRUARY 8.—**Leeds.**—PAVING, ETC.—The Highways Committee invite tenders for the paving and flagging of streets. Drawings may be seen at the City Engineer's Office, Municipal Buildings. Forms of tenders, etc., may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall-road.

FEBRUARY 8. — **Manchester.** — DRAINAGE WORK.— The Corporation invite tenders for the execution of general contractors' and plumbers' work that may be required in connexion with the drainage of houses and other premises, for a period of twelve months. Forms of tender, etc., may be obtained, and samples of work and materials seen, on application to Mr. H. Prescott, Manager of the Drainage Department, on payment of 1*l.* 1s. for each of the seven sections.

FEBRUARY 8.—**Powburn.**—SEWER.—The R.D.C. of Alnwick invite tenders for extending the main sewer at Powburn with 113 yds. of 12-in. sanitary pipes. The plan, etc., may be seen at the office of the Clerk, Mr. H. W. Walton, Alnwick.

FEBRUARY 10. — **Dukinfield.** — SEWAGE WORKS.— Stalybridge and Dukinfield Joint Sewerage Board invite tenders for extension of Sewage Disposal Works, Bradley Hurst, Dukinfield. Plans, etc., may be inspected, and any other particulars obtained, on application to the Engineer, Mr. J. P. Wilkinson, M.Inst.C.E., at his offices, 301 Cathedral-street, Manchester, on deposit of the sum of 2*l.* 2s.

FEBRUARY 10. — **Wellington (Salop).** — STREET WORKS. — The U.D.C. invite tenders for kerbing, channelling, and flagging with adamant concrete a number of streets and footpaths. Plans, etc., of works (in four separate contracts), may be seen at the office of Mr. Geo. Riley, the Council's Surveyor, 14, Walker-street, Wellington, Salop, by appointment, and on production of copy of specification and quantities, which may be obtained from Mr. J. W. Littlewood, Clerk to the Council, Bank-chambers, Wellington, Salop, on depositing a cheque for 2*l.* 2s.

FEBRUARY 12.—**Haselbury Plucknett.**—SEWERAGE AND SEWAGE DISPOSAL WORKS.—Yeovil R.D.C. invite tenders for providing and laying about 600 yds. of 6-in. sewer. The drawings, etc., may be seen at No. 30, Kingston, Yeovil, where a copy of the bill of quantities may be obtained on deposit of the sum of 1*l.*

FEBRUARY 13.—**Glasgow.**—MAIN DRAINAGE, SHIELDHALL OUTFALL WORKS.—The Corporation invite tenders for the execution under one contract of the excavator, brick and mason, timber, and other works required in the construction of the office buildings, etc., at Shieldhall. Plans, etc., may be seen, and specifications, etc., obtained, on application to the City Engineer, at his office, City Chambers, 64, Cochrane-street, Glasgow, by depositing 1*l.* 1s.

✱ FEBRUARY 13.—**Ilford.**—TAR PAVING.—The Ilford Education Committee invite tenders for levelling and tar paving the playgrounds of Valentine's School, Beehive-lane, Ilford. See advertisement in this issue for further particulars.

FEBRUARY 15.—**Stranraer.**—HARBOUR WORKS.—The T.C. invite tenders for dredging part of the harbour and for widening and repairing the West Pier. The plans may be seen at the office of the engineers, Messrs. Crouch & Hogg, C.E., 14, Blythswood-square, Glasgow, from whom copies of the specification, etc., may be obtained on payment of 2*l.* 2s. An assistant engineer will meet contractors at the Harbour Master's Office, Stranraer, at 1.30 p.m. on February 2.

✱ FEBRUARY 15. — **Streatham.** — MAKING-UP AND PAVING.—The Wandsworth B.C. invite tenders for making-up and paving of Parklands-road, Streatham. See advertisement in this issue for further particulars.

FEBRUARY 17.—**Bridport, Dorset.**—BOTHENHAMPTON SEWERAGE WORKS.—The Bridport R.D.C. invite tenders for the construction of stoneware pipe sewers and cast-iron pipe sewers, etc., in the Parish of Bothenhampton. Plans, etc., may be seen, and specifications, etc., may be obtained, on application of Mr. F. Cooper, civil engineer, Bridport, on payment of a deposit of 2*l.* 2s.

NO DATE.—**Pontycymmer.**—LAYING MAINS.—Garw and Ogmore Gas Company invite tenders for the laying of 900 yds. or thereabouts of 6-in. steel main. Specifications, etc., can be obtained from Mr. R. B. Silcox, Engineer and Manager, Plas Offices, Pontycymmer, on payment of 1*l.* 1s. for each copy.

STONES, MATERIAL, AND STORES.

FEBRUARY 1.—**Birkenhead.**—STONE.—The Corporation of Birkenhead invite tenders for the supply of granite and Rawtenstall kerbs and channels, Penmaenmawr breaking stone, and natural flags. Specifications, etc., may be obtained at the office of Mr. Charles Brownridge, M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Birkenhead.

FEBRUARY 1.—**Birkenhead.**—STORES.—The Corporation of Birkenhead invite tenders for the supply and delivery of stores and materials. Specifications, etc., may be obtained at the office of Mr. Charles Brownridge, M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Birkenhead.

FEBRUARY 2. — **Brentford.** — FLINTS. — Brentford U.D.C. invite tenders for the supply of 250 yds. of Kentish flints. Forms of tender, etc., may be obtained on application to Mr. J. W. Croxford, the Surveyor, at his office, Clifden House, Boston-road, Brentford.

✱ FEBRUARY 2.—**Willesden.**—ANNUAL CONTRACTS.— The Willesden D.C. invite tenders for execution of works and supply of materials. See advertisement in this issue for further particulars.

FEBRUARY 3. — **Grantham.**—MATERIALS.—Grantham R.D.C. invite tenders for the supply of materials (granite and slag). Specification, with form of tender, may be obtained at office of Mr. Aubrey H. Malim, Clerk to the Council.

FEBRUARY 3. — **London.** — MATERIALS.—The Metropolitan Asylums Board invite tenders for the supply of articles, etc. Forms of tender, giving all particulars, can be obtained at the office of the Board, Embankment, London, E.C.

FEBRUARY 3.—**London.**—MOTOR SPIRIT.—The Metropolitan Asylums Board invite tenders for the supply of motor spirit and petroleum. Forms of tender can be obtained at the office of the Board, Embankment, London, E.C.

FEBRUARY 3.—**New Sarum.**—WIRE FENCING.—The U.D.C. invite tenders for supplying about 350 lin. yds. of wire fencing with iron standards, wire netting, and gates. Particulars, etc., may be obtained on application to Mr. W. J. Goodwin, A.M.Inst.C.E., City Engineer and Surveyor, Municipal Offices, Salisbury.

FEBRUARY 3.—**Swansea.**—ROAD MATERIALS.—Swansea R.D.C. invite tenders for the supply of metalling and other materials for the repair of the roads in the Swansea Rural District, and also for the haulage of stones and removal of road scrapings, etc. Specifications, etc., may be obtained from Mr. Edward Harris (solicitor), Clerk, District Council Offices, Alexandra-road, Swansea, or from Mr. G. Powell Thomas, Highway Surveyor, Station-road, Forestfach.

FEBRUARY 4. — **Belfast.** — STORES.—The Midland Railway Company Northern Counties Committee (Ireland) invite contracts for stores. Patterns and samples can be inspected on application to the General Stores Department, Belfast. Forms of tender can be obtained on application to Mr. Ellis, Stores Superintendent, York-road Station, Belfast, on prepayment of 6d. for each form.

FEBRUARY 4.—**London.**—STORES.—The Directors of the Great Indian Peninsula Railway Company invite tenders for the supply of stores. Specifications, etc., may be obtained at office on payment of the fee for the specification, which payment will not be returned. Mr. J. I. Berry, Secretary, Company's Offices, 48, Copthall-avenue, E.C., London.

FEBRUARY 4. — **Warrington.** — MATERIALS. — The Paving and Sewerage Committee of the Council of the County Borough of Warrington invite tenders for the supply of the Committee's requirements during the twelve months ending March 31, 1910. Specifications, etc., may be seen, and forms of tender and all further information obtained, at the office of the Borough Surveyor, Town Hall.

FEBRUARY 4.—**West Ham.**—SCHOOL SUPPLIES.—The Education Committee invite tenders for the supply of timber, disinfectants, etc. Forms of tender, etc., may be obtained at the Town Clerk's Office, 95, The Grove, Stratford, E.

FEBRUARY 8.—**Birmingham.**—SUPPLIES.—Birmingham Tramways Committee invite tenders for the supply of material during the year ending March 31, 1910. Conditions of contract and forms of tender may be obtained on application to Mr. Alfred Baker, General Manager.

FEBRUARY 8.—**Bury.**—MATERIALS.—The Corporation of Bury invite tenders for the supply and delivery of materials during the year. Specifications prepared by Mr. Arthur W. Bradley, A.M.Inst.C.E., Borough Engineer and Surveyor, from whom intending contractors may obtain copies thereof and forms of tender.

FEBRUARY 8.—**East Retford.**—GRANITE AND SLAG.— East Retford R.D.C. invite tenders for the supply of broken granite and slag. Forms of tender and conditions of contract will be sent by Mr. Thomas Henry, Surveyor, Surveyor's office, East Retford, Notts, upon receipt of a stamped addressed foolscap envelope.

FEBRUARY 8.—**Kensington.**—CONTRACT FOR WORK, MATERIALS, ETC.—The Council of the Royal Borough of Kensington invite tenders for work, materials, etc., for one year. Forms of tender may be had, and further particulars obtained, on application at the office of Mr. Wm. Chambers Leete, Town Clerk, at the Town Hall, Kensington.

FEBRUARY 8. — **Manchester.**—CASTINGS.—The Corporation invite tenders for the supply of ventilating grids and other castings. Samples may be seen, and forms of tender obtained, on application to Mr. H. Prescott, Manager of the Drainage Department.

FEBRUARY 8. — **Surbiton.** — MATERIALS, ETC.—The U.D.C. invite tenders for stores, etc. Specifications and forms of tender may be obtained on application to Mr. Henry T. Mather, Surveyor to the Council, Council Offices, Surbiton.

FEBRUARY 9. — **Downham.** — GRANITE, ETC.—Downham R.D.C. invite tenders for the supply of materials. Form to be obtained from Mr. H. R. B. Wayman, Clerk to the Council, Council Offices, Downham Market.

FEBRUARY 9. — **Middlesbrough.** — WHINSTONE AND LIMESTONE.—The Middlesbrough R.D.C. invite tenders for the supply of whinstone (broken and unbroken) and of limestone for macadamising purposes. Further particulars and forms of tender may be obtained on application to Mr. W. H. Dixon, District Surveyor, Kirkby-in-Cleveland, near Stokesley, S.O., or Mr. William Richardson, Stokesley, S.O., Clerk for Highway Purposes to the Middlesbrough R.D.C.

FEBRUARY 9. — **Salisbury.** — GRAVEL, STONES.—The R.D.C. invite tenders for the supply of stones and gravel. The District Surveyor is Mr. D. W. Morrice, of Homington, of whom further particulars may be obtained. Tenders will be also received for the haulage of limestone and granite (if required). Forms may be obtained at office of Mr. Wm. H. Jackson, Clerk to the Council, Market House-chambers, Salisbury.

FEBRUARY 9. — **Southgate.**—ANNUAL CONTRACTS.— The U.D.C. of Southgate invite tenders for materials, etc. Specifications of each class of goods required, forms of tender, etc., may be obtained, on application to Mr. C. G. Lawson, C.E., the Council's Surveyor.

FEBRUARY 9. — **Uckfield.** — MATERIALS.—The R.D.C. of Uckfield invite tenders for material, haulage, and the hire of a steam road roller. Particulars, including specification, etc., may be obtained from Mr. E. W. Ray-Johnson, Surveyor's Office, Buxted, Uckfield, and will be forwarded on receipt of a stamped addressed envelope.

FEBRUARY 10. — **Louth.** — GRANITE AND SLAG.—The R.D.C. invite tenders for the supply of 11,000 tons of granite and 3,000 tons of slag (more or less). Forms of tender, etc., may be had on application to Mr. F. C. Chard, Clerk, Council House, Louth.

FEBRUARY 10.—**Portsmouth.**—ELECTRICITY SUPPLY. —Tenders are invited for the twelve months' supply of stores, etc. Particulars and forms of tender can only be obtained at the Electric Lighting Station, Gunwharf-road, Portsmouth.

FEBRUARY 11.—**Escrick.**—ROAD MATERIAL.—Escrick R.D.C. (East Riding of Yorkshire) invite tenders for the supply of best whinstone, tar macadam, slag, and granite. Forms of tender can be obtained of Mr. Fred. A. Camidge, Clerk to the above Council, 3, Stonegate, York, on receipt of stamped addressed foolscap envelope.

FEBRUARY 11.—**Frome.**—STORES.—The Frome U.D.C. invite tenders for the supply of materials for the year ending March 31, 1910. Particulars and forms of tender may be obtained upon application to Mr. F. W. Jones, A.M.Inst.C.E., Surveyor to the Council, the Public Offices, Frome.

FEBRUARY 11.—**Stokesley.**—WHINSTONE AND LIMESTONE.—The Stokesley R.D.C. invite tenders for the supply of whinstone (broken and unbroken) and of limestone for macadamising purposes. Further particulars and forms of tender may be obtained on application to Mr. W. H. Dixon, District Surveyor, Kirkby-in-Cleveland, near Stokesley, S.O., or Mr. William Richardson, Stokesley, S.O., Clerk to the Stokesley R.D.C.

FEBRUARY 11. — **Wolverhampton.** — LIME. — The Sewerage Committee invite tenders for the supply and delivery of lime to the Sewage Outfall Works. Specifications, etc., may be obtained from Mr. Wm. Clifford, A.M.Inst.C.E., Manager, Sewage Outfall Works, Wolverhampton.

FEBRUARY 11.—**Woolwich.**—ROAD MATERIAL, ETC.— The Council of the Metropolitan Borough of Woolwich invite tenders for the supply of road material, etc. Forms of tender, etc., can be obtained at the office of Mr. J. Rush Dixon, M.Inst.C.E., Borough Engineer, Town Hall, Woolwich.

FEBRUARY 12.—**Horncastle.**—ROAD MATERIAL.—The R.D.C. of Horncastle invite tenders for the supply of about 6,485 tons of granite (XX) and about 1,440 tons of slag (1½ in). Specifications, etc., may be obtained on application at the office of the Council.

FEBRUARY 12. — **Southampton.**—CAST-IRON PIPES, ETC.—Southampton Corporation invite tenders for the supply of cast-iron pipes and special castings. Specifications, etc., can be obtained from the Waterworks Engineer, French-street, Southampton. Every tender must be accompanied by the Borough Treasurer's receipt for a deposit of 5*l.* (Bank of England note).

FEBRUARY 13. — **Bath.** — ROAD MATERIALS. — The Somerset C.C. invite tenders for the supply of granite and basalt in lump, also macadam and chippings, for the County main roads. Specifications, etc., can be obtained upon application to the County Surveyor, Bath.

FEBRUARY 15.—**Folkestone.**—ANNUAL CONTRACTS.— The Corporation of Folkestone invite tenders for the supply of goods for the period of one year. Particulars, etc., may be obtained on application to Mr. A. E. Nichols, A.M.Inst.C.E., Borough Engineer, Corporation Offices, Folkestone.

FEBRUARY 15.—**Hornsey.**—MATERIALS.—The T.C. invite tenders for materials, etc. Forms of tender, etc., can be obtained from Mr. E. J. Lovegrove, Borough Engineer and Surveyor, Municipal Offices, No. 99, Southwood-lane, Highgate.

FEBRUARY 15.—**Salford.**—SUPPLIES.—The Tramways Committee invite tenders for twelve months' supply of materials. Forms of tender and further particulars may be obtained on application to the General Manager, Tramway Offices, 32, Blackfriars-street, Salford.

FEBRUARY 16. — **Barrow-in-Furness.**—MATERIALS. —The Corporation invite tenders for the supply of fire-bricks, cast-iron pipes, wrought-iron tubes and fittings, etc. Forms to be obtained at the office of the Manager of the Gas and Water Works.

FEBRUARY 16.—**Belfast.**—STONES, ETC.—Tenders are invited for suplying horse work, broken stones, screenings, etc., on the roads which are to be maintained by direct labour in the Rural District of Belfast. Specifications may be seen at the County Surveyor's Office, County Court-house, Belfast.

✱ FEBRUARY 16.—**Bromley.**—MATERIALS, ETC.—The Bromley B.C. invite tenders for supply of certain materials, etc. See advertisement in this issue for further particulars.

FEBRUARY 16.—**Halifax.**—SUPPLIES.—The Gasworks Committee of the Halifax Corporation invite tenders for the supply of materials, etc. Forms of tender and further information may be obtained on application to Mr. J. Wilkinson, F.C.S., Engineer, Gasworks, Halifax.

FEBRUARY 16.—**Lewisham.**—ANNUAL CONTRACTS FOR SUPPLIES.—Sewerage jobbing works, materials, horse hire, etc. Specifications etc., may be obtained at the offices of the Borough Surveyor, Town Hall, Catford, or will be remitted on receipt of stamped addressed foolscap envelope.

FEBRUARY 16. — **Long Sutton.** — GRANITE, ETC.— Long Sutton U.D.C. invite tenders for the supply of granite (590 tons) and slag (100 tons). No forms. Mr. Saml. Mossop, Clerk to the Council, Long Sutton, Lincolnshire.

FEBRUARY 16. — **St. Marylebone.** — STORES.—The Council of the Metropolitan Borough of St. Marylebone invite tenders for stores. General conditions, form of tender, etc., may be obtained of Mr. F. A. Wilkinson, 19-20, York-place, W.

FEBRUARY 17. — **Southwark.**—CONTRACTS.—Tenders are invited for contracts from April 1, 1909, to March 31, 1910, according to the specifications to be seen at the Town Hall, Walworth-road, S.E.

FEBRUARY 20. — **Canterbury.** — MATERIALS. — The Roads and Survey Committee invite tenders for the supply and delivery of materials for one year. Forms of tender, etc., may be obtained on application to Mr. Arthur C. Turley, A.M.Inst.C.E., City Engineer and Surveyor, City Surveyor's office, Guildhall-street, Canterbury.

FEBRUARY 25. — **Leeds.** — ANNUAL CONTRACTS FOR STORES.—The Leeds Corporation invite tenders for the supply of goods required for the Electric Lighting Department during the year. Schedules, etc., may be had on application to Mr. H. Dickinson, Manager of the Electric Lighting Department, 1, Whitehall-road, Leeds, stating the section for which the applicant desires to tender.

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*INSTRUCTOR IN HANDICRAFT (WOODWORK)	London County Council	100*l.* per annum	Feb. 6

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*WOOD-WORKING PLANT AND MACHINERY, BUNHILL-ROW, E.C.—On the Premises	Fuller, Horsey, Sons, & Cassell	Feb. 9
*WOOD-WORKING MACHINERY, ETC., KENNINGTON CROSS, S.E.—On the Premises	J. T. Skelding & Holland	Feb. 11
*FREEHOLD PROPERTIES, WYE, KENT—Saracen's Head Hotel, Ashford	H. & R. L. Cobb	Feb. 16
*FREEHOLD SITES, HAMPSTEAD—At the Mart	Furbers	Feb. 17

RECENT SALES.—*Continued from page* 130.

By MADDISON, MILES, & MADDISON (at Great Yarmouth).

Belton, Suffolk.—Freehold Market-gdn., 3 a. 0 r. 29 p. £500

January 21.—By MARK LIELL & SON.

Hackney.—119, Amhurst-rd., u.t. 61 yrs., g.r. 8*l.*, y.r. 42*l.*; also 68, Bonner-rd., u.t. 44¾ yrs., g.r. 5*l.* 5s., y.r. 37*l.* 550

Barking.—24 to 30 (even), Wakering-rd., f., w.r. 83*l.* 4s. 800

26 to 38 (even) Church-rd., u.t. 48 yrs., g.r. 36*l.* 15s., w.r. 127*l.* 8s. 350

By NEWBON, SHEPHARD, & EDWARDS.

Bethnal Green.—1 to 15 (odd), Diss-st.; 9 to 17, Chapel-st.; 16 to 24, Arline-st.; and 1 to 6, King's-pl., area 24,000 ft., f., y.r. 260*l.* 4,950

St. Luke's.—12, 16, 18, and 20, Gee-st., f., e.r. 100*l.* 605

Canonbury.—31, Alwyne-villas, u.t. 10 yrs., g.r. 6*l.* 6s., e.r. 34*l.* 140

Barnsbury.—50, Wellington-rd., u.t. 35 yrs., g.r. 7*l.*, q.r. 28*l.* 135

By STIMSON & SON.

Barnsbury.—89, 91, and 93, Bride-st., f., w.r. 117*l.* 780

Peckham.—70, 72, and 74, Grenard-rd., u.t. 56 yrs., g.r. 15*l.*, w.r. 117*l.* 650

Brixton.—2 and 2A, Myatt-rd., f., w.r. 62*l.* 8s. 520

Peckham.—94 to 100 (even), Tilson-rd., u.t. 54½ yrs., g.r. 9*l.*, w.r. 127*l.* 8s. 600

By BAXTER, PAYNE, & LEPPER (at Beckenham).

Beckenham.—102, Durban-rd., u.t. 90 yrs., g.r. 4*l.* 6s., p. 285

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. public-house; o. for offices; s. for shops; ct. for court.

PRICES CURRENT OF MATERIALS.

**** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Best Stocks	1 6 0	per 1000 alongside, in river.
Picked Stocks for Facings	2 10 0	,, delivered
Flettons	1 4 0	,, at railway depôt.
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing	5 0 0	,, ,, ,,
Best Blue Pressed Staffordshire	3 15 0	,, ,, ,,
Do. Bullnose	4 0 0	,, ,, ,,
Best Stourbridge Fire Bricks	3 14 0	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers	10 7 6	,, ,, ,,
Headers	9 17 6	,, ,, ,,
Quoins, Bullnose, and Flats	13 17 6	,, ,, ,,
Double Stretchers	15 17 6	,, ,, ,,
Double Headers	12 17 6	,, ,, ,,
One Side and two Ends	16 17 6	,, ,, ,,
Two Sides and one End	17 17 6	,, ,, ,,
Splays, Chamferred, Squints	15 10 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers	10 7 6	,, ,, ,,
Headers	9 17 6	,, ,, ,,
Quoins, Bullnose, and Flats	13 17 6	,, ,, ,,
Double Stretchers	15 17 6	,, ,, ,,

BRICKS, &c. (*continued*).

GLAZED BRICKS (*continued*).	£ s. d.	
Double Headers	12 17 6	per 1000 at railway depôt.
One Side and two Ends	16 17 6	,, ,, ,,
Two Sides and one End	17 17 6	,, ,, ,,
Splays, Chamferred, Squints	15 10 0	,, ,, ,,
Second Quality White and Dipped Salt Glazed	1 5 0	,, less than best.

	s. d.	
Thames and Pit Sand	6 6	per yard, delivered.
Thames Ballast	5 0	,, ,,
Best Portland Cement	28 0	per ton, ,,
Best Ground Blue Lias Lime	19 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8¼	,, ,,
PORTLAND STONE (20 ft average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1	,, ,,
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2¼	,, ,,

	s. d.	
Ancester in blocks	1 10	per ft. cube. deld. rly. depôt
Beer ,,	1 6	,, ,,
Greenshill ,,	1 10	,, ,,
Darley Dale in blocks	2 4	,, ,,
Red Corsehill ,,	2 2	,, ,,
Closeburn Ree Freestone	2 0	,, ,,
Red Mansfield ,,	2 4	,, ,,

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. dep
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super. ,,
6 in. rubbed two sides ditto, ditto	2 6	,, ,,
3 in. sawn two sides slabs (random sizes)	0 11½	per ft. cube. ,,
2 in to 2½ in. sawn one side slabs (random sizes)	0 7¼	,, ,,
1½ in. to 2 in. ditto, ditto	0 6	,, ,,
HARD YORK—		
Scappled random blocks	3 0	,, ,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8	per ft. super. ,,
6 in. rubbed two sides ditto	3 0	,, ,,
3 in. sawn two sides slabs (random sizes)	1 2	,, ,,
2 in. self-faced random flags	0 5	,, ,,

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at r.d.
20×12 ,, ,,	13 17 6	,, ,,
20×10 first quality ,,	13 0 0	,, ,,
20×12 ,, ,,	13 15 0	,, ,,
16×8 ,, ,,	7 5 0	,, ,,
22×10 best blue Portmadoc	12 12 6	,, ,,
16×8 ,, ,,	6 12 6	,, ,,
20×10 best Eureka unfading green	15 17 6	,, ,,
20×12 ,, ,,	18 7 6	,, ,,
18×10 ,, ,,	13 5 0	,, ,,
16×8 ,, ,,	10 5 0	,, ,,
20×10 permanent green	11 12 6	,, ,,
18×10 ,, ,,	9 12 6	,, ,,
66×8 ,, ,,	6 12 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000, at rly depôt.
Hip and Valley tiles	3 7	per doz. ,,
Best Broseley tiles	50 0	per 1000 ,,
Do. Ornamental tiles	52 6	,, ,,
Hip and Valley tiles	4 0	per doz. ,,

TILES (*continued*).

	s. d.	
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 at rly. depot.
Do. Ornamental do.	60 0	,, ,,
Hip tiles	4 0	per doz. ,,
Valley tiles	3 0	,, ,,
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 ,,
Do. Ornamental do.	54 6	,, ,,
Hip tiles	4 1	per doz. ,,
Valley tiles	3 8	,, ,,
Best "Rosemary" brand plain tiles	48 0	per 1000 ,,
Best Ornamental tiles	50 0	,, ,,
Hip tiles	4 0	per doz. ,,
Valley tiles	3 8	,, ,,
Best "Hartshill" brand plain tiles, sand-faced	50 0	per 1000 ,,
Do. pressed	47 6	,, ,,
Do. Ornamental do.	50 0	,, ,,
Hip tiles	4 0	per doz. ,,
Valley tiles	3 6	,, ,,
Staffordshire (Hanley) Reds or Brindled tiles	42 6	per 1000 ,,
Hand-made sand-faced	45 0	,, ,,
Hip tiles	4 0	per doz. ,,
Valley tiles	3 6	,, ,,

WOOD.

BUILDING WOOD.	At per standard.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	£ s. d. ... £ s. d.	13 10 0 ... 15 0 0
Deals: best 3 by 9		13 0 0 ... 14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.		11 0 0 ... 12 0 0
Battens: best 2½ by 6 and 3 by 6		0 10 0 less than 7 in. and 8 in.
Deals: seconds		1 0 0 less than best
Battens: seconds		0 10 0 ,,
2 in. by 4 in. and 2 in. by 6in.		9 0 0 ... 10 0 0
2 in. by 4½ in. and 2 in. by 5 in.		8 10 0 ... 9 10 0
Foreign Sawn Boards—1 in. and 1¼ in by 7 in.		0 10 0 more than battens
¾ in.		1 0 0 ,,
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft.	4 10 0 ... 5 0 0
Seconds		4 0 0 ... 4 10 0
Small timber (8 in. to 10 in.)		3 12 6 ... 3 15 0
Small timber (6 in. to 8 in.)		3 0 0 ... 3 10 0
Swedish balks		2 10 0 ... 3 0 0
Pitch-pine timber (30 ft. average)		4 0 0 ... 4 15 0

JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.	£ s. d. ... £ s. d.	24 0 0 ... 25 0 0
3 in. by 9 in.		22 0 0 ... 23 0 0
Batten 2½ in. and 3 in. by 7 in.		16 10 0 ... 18 0 0
Second yellow deals, 3 in. by 1 in.		18 10 0 ... 20 0 0
,, ,, 3 in. by 9 in.		17 10 0 ... 19 0 0
Battens, 2½ in. and 3 in. by 7 in.		13 10 0 ... 14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.		13 10 0 ... 15 0 0
Battens, 2½ in. and 3 in. by 7 in.		11 0 0 ... 12 0 0
Petersburg first yellow deals, 3 in. by 11 in.		21 0 0 ... 22 10 0
Do. 3 in. by 9 in.		18 0 0 ... 19 10 0
Battens		13 10 0 ... 15 0 0
Petersburg second yellow deals, 3 in. by 11 in.		16 0 0 ... 17 0 0
Do. 3 in. by 9 in.		14 10 0 ... 16 0 0
Battens		11 0 0 ... 12 10 0
Third yellow deals, 3 in. by 11 in.		13 0 0 ... 14 0 0
Do. 3 in. by 9 in.		12 10 0 ... 14 0 0
Battens		10 0 0 ... 11 0 0
White Sea and Petersburg—First white deals, 3 in. by 11 in.		14 10 0 ... 15 10 0
,, ,, 3 in. by 9 in.		13 10 0 ... 14 0 0
Battens		11 0 0 ... 12 0 0
Second white deals, 3 in. by 11 in.		13 10 0 ... 14 10 0
,, ,, 3 in. by 9 in.		12 10 0 ... 13 10 0
Battens		10 0 0 ... 11 0 0
Pitch-pine: deals		18 0 0 ... 21 0 0
Under 2 in. thick extra		0 10 0 ... 1 0 0
Yellow pine—First, regular sizes		44 0 0 upwards.
Oddments		32 0 0 ,,
Seconds, regular sizes		33 0 0 ,,
Oddments		28 0 0 ,,
Kauri Pine—Planks, per ft. cube		0 3 6 ... 0 5 0
Danzig and Stettin Oak logs—Large, per ft. cube		0 3 0 ... 0 3 9
Small ,, ,,		0 2 6 ... 0 2 6
Wainscot Oak Logs, per ft. cube		0 5 6 ... 0 6 0
Dry Wainscot Oak, per ft. sup. as inch		0 0 8½ ... 0 0 9½
¼ in. do. do		0 0 7 ... —

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	£ s. d.	£ s. d.
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. super, as inch	0 0 10	0 1 0
Teak per load	17 0 0	22 0 0
American Whitewood Planks, per ft. cube	0 4 0	0 5 0
Prepared Flooring, etc.—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 0
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
⅞ in. by 7 in. yellow matched and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. " "	0 14 0	0 18 0
⅞ in. by 7 in. white " "	0 10 0	0 11 6
1 in. by 7 in. " "	0 12 9	0 15 0
6 in. at 6d. to 9d. per squar	less than 7in.	

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 0 0	7 10 0
Compound Girders, ordinary sections	9 0 0	10 0 0
Steel Compound Stanchions	11 0 0	2 0 0
Angles, Tees, and Channels, ordinary sections	9 0 0	10 0 0
Flitch Plates	9 0 0	9 10 0
Cast Iron Columns and Stanchions including ordinary patterns	7 10 0	8 10 0

METALS.

IRON—	Per ton, in London. £ s. d.	£ s. d.
Common Bars	8 10 0	9 0 0
Staffordshire Crown Bars, good merchant quality	8 15 0	9 5 0
Staffordshire "Marked Bars"	10 10 0	—
Mild Steel Bars	8 15 0	9 5 0
Hoop Iron, basis price	9 5 0	9 10 0
" " Galvanised	17 0 0	—
(*And upwards, according to size and gauge.)		
Sheet Iron Black—		
Ordinary sizes to 20 g.	9 15 0	—
" " 24 g.	10 15 0	—
" " 26 g.	12 5 0	—
Sheet Iron, Galvanized, flat, ordinary quality—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15 0 0	—
Ordinary sizes to 22 g. and 24 g.	15 10 0	—
" " 26 g.	13 10 0	—
Sheet Iron, Galvanized, flat, best quality—		
Ordinary sizes to 20 g.	18 0 0	—
" " 22 g. and 24 g.	18 10 0	—
" " 26 g.	20 0 0	—
Galvanised Corrugated Sheets—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	14 10 0	—
" " 22 g. and 24 g.	14 15 0	—
" " 26 g.	16 5 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	—
Best Soft Steel Sheets, 22 g. & 24 g.	13 0 0	—
" " " 26 g.	15 0 0	—
Cut Nails, 3 in. to 6 in.	10 10 0	11 0 0
(Under 3 in., usual trade extras.)		

LEAD, &c.	Per ton, in London. £ s. d.	£ s. d
LEAD—Sheet, English, 3lb. and up.	16 10 0	—
Pipe in coils	17 0 0	—
Soil pipe	19 0 0	—
Compo pipe	20 0 0	—
ZINC—Sheet—		
Vielle Montagne ton	26 10 0	—
Silesian	26 5 0	—
COPPER—		
Strong sheet per lb.	0 1 0	—
Thin " "	0 1 1	—
Copper nails "	0 0 10	—
Copper wire "	0 0 10	—
BRASS—		
Strong Sheet "	0 0 11	—
Thin "	0 1 0	—
TIN—English Ingots "	0 1 5	—
SOLDER—Plumbers "	0 0 7	—
Tinmans "	0 0 9½	—
Blowpipe "	0 1 0	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d. per ft. delivered.
" fourths	1½d. " "
21 oz. thirds	3d. " "
" fourths	2½d. " "
26 oz. thirds	4d. " "
" fourths	3d. " "
32 oz. thirds	4½d " "
" fourths	4½d. " "
Fluted Sheet, 15 oz	3½d. " "
" 21 oz.	4½d. " "

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2½d. per ft. delivered.
3/16 "	2⅝d. " "
¼ "	2⅝d. " "
Figured, Oxford Rolled and *Oceanic" Glass, white	3½d. " "
" " tinted	5d. " "
OTHER GLASS—	
"Arctic" Glass, white	3½d. " "
" " tinted	5d. " "
" " Ruby and opalescents	1s. " "

OILS, &c.		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 1 11
" " ,, in barrels	"	0 2 0
" " ,, in drums	"	0 2 3
Boiled ,, ,, in barrels	"	0 2 3
" " ,, in drums	"	0 2 6

OILS, &c. (*continued*).		£ s. d.
Turpentine in Barrels	per gallon	0 2 7
" in drums	"	0 2 9
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	"	20 0 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.	Per gallon.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 6
Fine Elastic Carriage	0 12 0
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Mapel	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flating Varnish	0 18 0
White Pale Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 0
Berlin Black	0 16 0
Knotting	0 10 9
French and Brush Polish	0 10 6

PUBLISHER'S NOTICES.

Nat. Tel., 6112 Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME XCV. (July to December, 1908) was given as a supplement with the issue of January 9th.

CLOTH CASES for Binding the Numbers are now ready, price 2s. 6d. each; also

READING CASES (Cloth), with Strings, price 9d. each.

THE NINETY-FIFTH VOLUME of "The Builder" (bound), price Twelve Shillings and Sixpence.

SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of 3s. 6d. each.

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, etc., etc.

Six lines or under ..... 6s. 0d.
Each additional line ..... 1s. 0d.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade advertisements, and for front page and other special positions, on application to the Publisher.

SITUATIONS WANTED (Single-handed—Labour only).

Four lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent; but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," 4, Catherine Street, W.C.

Advertisements for the current week's issue are received up to ONE p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after TWELVE NOON on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have *Replies addressed to the Office*, 4, Catherine Street, Strand, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

N.B.—The Reply Boxes are not intended for trade lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed), 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursday*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcement of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*

BERKHAMSTED. — For erecting new elementary school for fifty-six children at Whelpley Hill, Ashley Green, for the Bucks County Education Committee. Mr. C. H. Riley, Architect, Education Office, Aylesbury :—

J. Honour & Sons	£710 0	J. Mead	£639 0
G. Parsons	698 0	F. G. Rust, Chesham‡	639 0
G. Darlington	689 10		
Webster & Cannon	668 0		

‡ Chosen by ballot.

BOURNE-END.—For villa residence in Cores-End Bourne-End, Bucks, for Mr. A. W. Johnston. Mr. J. Deacon, architect, Marlow, in conjunction with Mr. H. Stanton Webber, architect and surveyor, Maidenhead :—

Lovell & Son	£667 0	H. Harris & Son, Little Marlow-road, Marlow*	£519 0
W. & T. Sellman	631 16		
J. Gering & Son	559 0		

ERITH (Kent).—For erecting buildings for laundry, and disinfecting chamber at the Erith Sanatorium, Little Heath, Belvedere, for the Urban District Council. Mr. Harold Hind, Surveyor, Erith Urban District Council :—

G. H. Gunning & Sons (Erith)* £399 17 6

ERITH.—For extension of workshop at tramcar-sheds building, Walnut Tree-road, for the Urban District Council. Mr. Harold Hind, Surveyor. Quantities by Erith Urban District Council :—

G. H. Gunning & Sons, Erith* £393

EXMOUTH.—For constructing roads and sewers on the Halsdon Building Estate, Exeter-road, for the East Devon Brick and Tile Company, Ltd. Mr. P. Kerley, surveyor, National Provincial Bank-chambers, The Strand, Exmouth :—

N. Pratt	£1,520 0 0	Grounds & Newton	£1,085 0 0
J. Titt	1,349 8 0	Cooper & Son	1,062 13 10
Harris	1,270 10 6	E. H. Bate	1,019 4 4
Cranson & Co.	1,256 0 0	A. W. Taylor, Withycombe, near Exmouth*	991 18 0
Lacey & Co.	1,200 0 0		
H. J. Lacey	1,150 0 0		
W. H. Taylor	1,149 5 0		

FISHPONDS (Bristol).—For extension of All Saints' Church. Messrs. Lingen-Barker, Son, & Ellis, architects, 3, Unity-street, Bristol :—

W. Cowlin & Son	£3,010 0 0
J. Browning	2,654 11 6
J. Perkins & Son	2,638 0 0
W. Preece	2,610 0 0
Adams & Jefferies	2,604 0 0
Forse & Son	2,596 0 0
Ridd & Sons	2,524 0 0
T. C. Gluyas	2,480 0 0
Marsh & Stone	2,460 0 0
E. Walters & Son	2,385 0 0
E. Love	2,375 0 0
Hayes & Son	2,371 0 0
E. Clark & Sons, Fishponds†	2,255 0 0

GREAT BERKHAMPSTEAD. —For reconstruction of King's-road bridge, for the Urban District Council. Messrs. Thomas & Thomas, engineers, 191, Edgware-road, Paddington, Mr. W. E. H. Adey, Surveyor to the Council, 177, High-street, Berkhampstead :—

		Allowance for Bridge.
Somervail & Co.	£1,344 0 0	£1
R. Owen & Co.	1,300 0 0	30
Heenen & Froude, Ltd.	1,230 0 0	—
E. C. & J. Keay, Ltd.	1,222 10 0	—
A. Findlay & Co.	1,170 0 0	60
G. Sands & Son	1,180 0 0	80
Drew, Bear, Perks, & Co., Ltd.	1,121 0 0	40
J. Tildesley, Ltd.	1,089 7 6	40
Rowlingsons & Co.	1,041 0 0	40
J. Brettell & Co., Worcester*	1,042 5 0	60

LONDON.—For supply of cylinders, central car-repair depôt, for the London County Council :—

Thames Ironworks, Shipbuilding, and Engineering Co., Ltd.	£275 0 0
East Ferry-road Engineering Works Co., Ltd.	232 10 0
A. Goodwin & Son	183 15 0
Mountain & Gibson	162 10 0
Heenan & Froude, Worcester*	152 0 0

LONDON.—For receiving ward accommodation at the St. John's-road Workhouse, Upper Holloway, N., for the Islington Guardians. Mr. W. Lockwood, architect, 12, Sherwood-street, Piccadilly Circus, London. W. Quantities by Mr. Thomas Thompson, 90, Cannon-street, E.C.:—

Stapleton & Sons	£3,470 0 0
Warburton & Son	3,020 0 0
Newell & Lusby	2,977 19 3
Spencer Santo	2,970 0 0
W. Lawrence & Son	2,849 0 0
Kirk & Randall	2,768 0 0
Stevens & Sons	2,706 0 0
Wm. Johnson & Co.	2,695 0 0
Dearing & Co.	2,683 0 0
T. Hickman	2,650 4 3
Sprosson & Babb	2,649 10 3
M. Calnan & Son	2,637 0 0
W. H. & R. Roberts	2,627 0 0
F. Deacon & Son	2,598 0 0
Mallock Bros.	2,577 0 0
W. H. Hyde & Co.	2,575 0 0
A. & R. Lowe & Co.	2,519 0 0
F. Webster & Son	2,499 0 0
F. & G. Foster	2,488 0 0
C. P. Roberts & Co.	2,479 0 0
McLaughlin & Harvey, 13, Brecknock-road, N.W.*	2,291 6 3

LONDON.—For providing a subway between the new administrative block and pavilion "D" of the Infirmary, High-street, Homerton, N.E., for Hackney Guardians: —

Bentley & Son	£1,400	Dearsly & Son	£1,203
C. Ford	1,362	W. H. Hyde & Co.	1,164
W. Reason	1,349	F. & G. Foster, Norwood Junction, S.E.*	974
Rowlingsons & Co.	1,287		
Kirk & Randall	1,240		

[The accepted tender is subject to the approval of the Local Government Board.]

CHIPPING NORTON.—For additions to house and stabling at "Foxholes" Chipping Norton, Oxon, for Mr. Horsman Bailey, Berners-street, London. Messrs. Cancellor & Hill, Architects, 12, Jewry-street, Winchester :—

—	House	Stables.	Stable & Barn.	Total.
	£ s. d.	£. s. d.	£. s. d.	£. s. d.
T. Burden	4,150 0 0	504 0 0	598 0 0	5,252 0 0
Knowles & Sons	3,939 0 0	600 0 0	557 0 0	5,096 0 0
Benfield & Loxley	3,869 0 0	552 0 0	522 0 0	4,943 0 0
Cubitt & Co.	3,883 0 0	484 0 0	555 0 0	4,922 0 0
G. Howman & Co.	3,750 0 0	440 0 0	515 0 0	4,705 0 0
Booth & Son	3,677 10 0	406 0 0	500 0 0	4,583 10 0
G. & T. Cannon	3,695 0 0	448 0 0	421 0 0	4,544 0 0
A. Groves & Sons, Milton, Oxfordshire*	3,598 0 0	398 0 0	499 0 0	4,495 0 0
Grace & Sons	3,586 0 0	423 0 0	482 0 0	4,491 0 0

LONDON.—For external painting work at the Workhouse, Marloes-road, Kensington, for Kensington Board of Guardians :—

R. Athey	£486	12	0	T. Brown & Son	£205	0	0
E. Stone	357	18	6	E. Oughton....	198	12	0
A. Ross	348	10	0	G. Brown	196	10	0
A. T. Wallis....	324	5	8	F. Webster & Son	193	0	0
Frost & Son ..	317	10	0	Marchant & Hunt	179	0	0
Holliday & Greenwood, Ltd.	289	0	0	J. Hocking & Co.	179	0	0
W. Chappell ..	240	0	0	T. Osborn & Sons	168	0	0
G. A. Rowley ..	216	10	0	M. McCarthy ..	155	0	0
Squire & Farrant	212	10	0	A. F. Inns	138	0	0
G. H. Brown ..	208	16	0	J. Johnson	136	0	0
W. Sudds & Son	205	4	0	S. T. Wright & Co., 150, Brixton-hill, S.W.*	132	11	4

LONDON.—For the erection of cottages on the third part of section C of the Totterdown-fields estate, for the London County Council :—

Leslie & Co., Ltd.	£31,372	0	0
F. & H. F. Higgs	29,752	0	0
F. W. Fletcher	28,745	0	0
W. Akers & Co., Ltd.	27,269	0	0
C. Wall, Ltd.	26,885	0	0
F. & T. Thorne	25,943	0	0
J. Smith & Sons Ltd.	25,517	0	0
A. Roberts & Co., Ltd.	25,028	5	0
G. E. Wallis & Son, Ltd.	24,990	0	0
Gathercole Bros.	24,891	0	0
G. H. Carter	24,383	10	0
Rowley Bros.‡	22,130	0	0

‡Recommended for acceptance.

[The Architect's estimate, comparable with the tenders, is £26,300.]

LONDON. — For additional buildings, the Manor Asylum, for the London County Council :—

Ashby & Horner	£12,442	0	0
Holliday & Greenwood.	12,215	0	0
Leslie & Co., Ltd.,	11,821	0	0
Perry & Co.	11,697	0	0
E. Lawrance & Son	11,540	0	0
J. Greenwood, Ltd.	11,428	0	0
Holloway Bros. (London), Ltd. ..	11,400	0	0
Godson & Son	10,875	0	0
W. Johnson & Co., Ltd.	10,790	0	0
J. S. Carmichael (Wandsworth)* ..	10,636	4	2

LONDON.—For erection of Special school, Harmood-street, St. Pancras, W., for the London County Council :—

Ford & Walton, Ltd.	£6,851	0	0
G. S. S. Williams & Son	6,657	0	0
Patman & Fotheringham, Ltd.	6,538	0	0
Spencer, Santo, & Co., Ltd	6,454	0	0
Rice & Son	6,353	0	0
C. P. Roberts & Co.	6,322	0	0
Leslie & Co., Ltd.	6,315	7	5
L. H. & R. Roberts.	6,225	0	0
McLaughlin & Harvey, Ltd.	5,948	6	0
G. Godson & Sons	5,884	0	0
E. Lawrance & Sons, Wharf-road, City-road‡	5,774	0	0

‡ Recommended for acceptance.

[The estimate of the Architect (Education), comparable with the tenders, is £6,091.]

MORLEY.—For alterations and additions to Peel-street Mills. Mr. T. A. Buttery, architect, Queen-street, Morley, and at Leeds :—

Mason : H. Spensley, Morley*	£310	16	5
Joiners : Wilkinson & Sanderson, Pudsey* ..	230	0	0
Plumber : B. Gomersal, Morley*	48	10	0
Plasterers : J. Iredale & Son, Birstall*	18	7	0
Slaters : J. Atkinson & Son, Ltd., Leeds*	37	0	0

OSWESTRY.—For erecting a Sunday-school, for the English Baptist Church. Mr. W. J. Oliver, M.S.A., architect, 1, Darlington-street, Wolverhampton, and Oswestry :—

		Amended Tender.
G. Bickerton	£910	£688
J. Higgins	855	—
W. H. Thomas	845	625
Jones & Evans, Oswestry	830	*620

PAIGNTON (Devonshire).—For Cliff-road sewer, for the Urban District Council. Mr. C. Owen Baines, Surveyor :—

Herbert Drew, Paignton* £356 0 0

PADSTOW.—For the construction of a piece of road 350 ft. long and 35 ft. wide, Prideaux-Brune Building Estate and Drainage Works. Mr. T. H. Andrew, Engineer, Market-hill, St. Austell :—

A. Williams	£980	0	0
E. R. Lester	936	0	0
J. Shaddock	890	0	0
J. Williams & Son	850	0	0
J. Budge & Son	615	0	0
W. E. Bennett	589	0	0
Steer & Pearce	553	0	0
W. Nankivell & Sons, St. Breward, Bodmin*	537	7	6
Stevenson	450	0	0

SHOEBURYNESS.—For constructing 540 yds. of surface water drain, with manholes, and gulley connexions, for the Urban District Council. Mr. H. A Harris, Surveyor, Clarence-street, Southend :—

A. J. Harris, Shoeburyness £179 11 6

SOUTHEND-ON-SEA.—For making up Albion-road, for the Corporation. Mr. E. J. Elford, Borough Engineer and Surveyor, Southend :—

Fry Bros.	£853	0	0	W. Iles, Southend-on-Sea*	£808	0	0
W. Buxton	831	0	0				
Parsons & Parsons	816	0	0				

SURBITON.—For reconstructing combined drains, etc. Nos. 41 to 44, Cottage-grove, and 43 to 45A, Victoria-road, for the Urban District Council. Mr. W. Nesfield, Sanitary Inspecter, Council Offices, Surbiton :—

T. J. Cooper ..	£112	10	6	T. Johnson.....	£68	9	8
Bull & Esdaile	89	0	0	E. Scase, Berrylands-road, Surbiton*	67	15	0
Foster & Sons ..	79	17	6				
W. H. Gaze & Sons	79	0	0				

WHITBY.—For alterations and additions to the end block of tenements in the middle yard of the Seamen's Hospital, Church-street. Mr. E. H. Smales, A.R.I.B.A., 5, Flowergate, Whitby :—

J. Kidd & Son	£828	0	0
W. Nelson	806	2	11
A. Palfroman	784	19	10
W. Lawson	771	2	1
J. Braim & Son	764	0	11
W. Chapman	756	14	0
R. Lennard & Sons	743	19	0
R. A. Wilson*	721	1	0

WALLINGTON.—For the erection of a pair of cottages in Grosvenor-avenue. Mr. Douglas Weightman, architect, 78, North-end, Croydon :—

Crossley & Sons ..	£855	0		Everitt.....	£675	0	
Tugwell	725	0		Roberts & Tilbury	649	0	
Howe & White ..	697	10		Sanders*	630	0	
Cheshire	697	0					

WARLEY.—For new schools, Abbey-road, for the Oldbury Urban District Council Education Committee. Mr. W. F. Edwards, architect, 1, Newhall-street, Birmingham :—

W. Jackson, Langley-green, Birmingham £9,485

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